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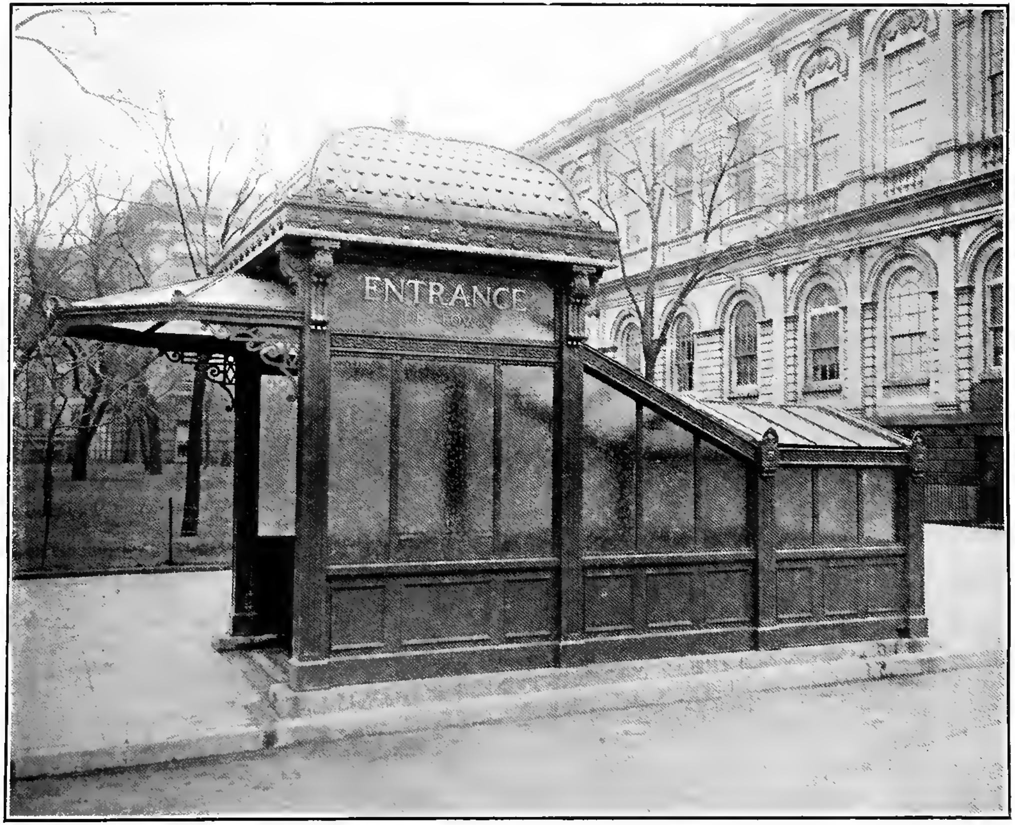

Entrance to City Hall Station.

REPORT

OF THE

Board of Rapid Transit Railroad Commissioners

FOR AND IN

THE CITY OF NEW YORK

FOR THE YEAR ENDING

December 31, 1903

Accompanied by Reports

OF THE

Chief Engineer

AND OF THE

Auditor

NEW YORK
1904

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REPORT

OF THE

COMMISSIONERS

WITH APPENDICES

OFFICE OF THE

BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS.

No. 320 Broadway, New York,
January 1, 1904.

To the Mayor of the City of New York,

Sir:—The Board herewith transmits its report for the year 1903.

Apart from the carrying on of the work of construction under contracts for the Manhattan-Bronx Railroad and the Brooklyn-Manhattan Railroad, and the granting of the franchise for addtional tunnel facilities under the Hudson river, the Commission during the year 1903 have been chiefly occupied in studying the larger question of a general solution of the rapid transit problems now so pressing in New York. The like problems are also urgent in the other great cities of the world; but in New York the completion of the Williamsburg bridge, and the prospect of the early completion of the Manhattan bridge, have made it doubly important that the problem here should be dealt with at an early day in a practical and thorough manner.

I.

FUTURE RAPID TRANSIT.

On May 9, 1902, the Chief Engineer was officially requested to prepare and submit to the Board a comprehensive scheme or plan of rapid transit for the whole city. It was not the intention that the plan should be prepared for immediate execution; but it was the expectation that if a general scheme was wisely prepared, rapid transit construction would proceed upon the lines so laid down as rapidly as the means of the city and the amount of private capital ready for such investment would permit; and that relatively unimportant franchises would not thereafter be granted for special rights so as to prevent or obstruct a permanent and sufficient programme.

The necessity for undertaking this general study of the rapid transit situation in the city was made all the more evident by the fact of the enormous increase in passenger travel on all existing lines during the year 1903. The statistics clearly indicate that when the present subway system now under construction from Brooklyn to The Bronx is completed, it will almost be immediately congested, so that no great amount of permanent relief can be counted on from that source. In order to meet the growing and imperative demands for increased facilities it is evident to the Board that new lines should be laid out and put under construction as soon as possible, and that steps should be taken to improve the existing facilities.

PLANS FOR MANHATTAN AND THE BRONX.

On February 19, 1903, the Chief Engineer presented his report on a comprehensive plan for rapid transit in the Boroughs of Manhattan and The Bronx. This report is printed in full in the Chief Engineer's report. In general, the recommendations were as follows:

First.—To complete the present subway system in Manhattan and The Bronx in accordance with the original intention of the Rapid Transit Board, by extending the subway south from 42nd street along the general line of Broadway, or parallel thereto on the west; and by extending it north from 42nd street, at Park avenue, along Lexington avenue to 149th street. He proposed that branches should be constructed from Broadway to the Pennsylvania Railroad station at Seventh avenue; along 110th street to Lenox avenue; from West Farms in The Bronx to Wakefield; and along the Southern Boulevard and 180th street. A connection between the Bronx Park line and the Manhattan Elevated was recommended from Brook avenue along Westchester avenue to Third avenue; and this connection has since been authorized by the Board, and will, it is hoped, shortly be constructed.

Second.—It was proposed to increase the number of tracks on the Second and Third Avenue Elevated Railroads; to extend the Sixth Avenue Railroad along Christopher street to Greenwich street; to add a third track to the Ninth Avenue Railroad, and to connect the elevated system with a subway to be built along Tenth avenue to a connection with the present subway at 72nd street; and to make an arrangement with the Putnam Division of the New York Central Railroad Company so as to improve the service on that line.

Third.—To arrange for physical connection with the several railroads now terminating at the Grand Central Station.

Fourth.—To provide for an extension of the New York Central Railroad Company's tracks south from 59th street and Eleventh avenue by an elevated structure along their present right of way or possibly along West street to Battery place.

Fifth.—To construct a branch of the Second Avenue Elevated Railroad along 64th street and over the Blackwell's Island Bridge to Long Island, with a provision for future extension of such line as soon as the necessary demand might arise.

The proposed extensions to the rapid transit railway now under construction, as proposed by the Chief Engineer, seemed to the Board to be open to the possible criticism that the lines as laid out could not be offered to public competition inasmuch as they would be available only to the corporation operating the present subway; and the Chief Engineer was therefore instructed to make a study for an additional east side line as a continuation south from 45th street of the proposed Lexington avenue line.

On March 19, 1903, the Chief Engineer made a supplemental report on the subject, which appears in his report.

In reference to the extension of the subway southerly from Forty-second street and Broadway, considerable opposition was aroused on the part of abutting property owners who feared the injury that might be likely to arise from disturbances in the street during the process of construction. An alternative route from Forty-second street southerly along the line of Seventh avenue has been under consideration.

In the month of December, 1903, the Metropolitan Street Railway Company interests communicated with the Board upon the subject of the construction of another north and south rapid transit railroad, to be independent of the railroad now in course of construction. Gentlemen representing these interests informed the Board that if there should be adopted routes and plans of a new line so devised as to supplement the service to the traveling public rendered by the Metropolitan system, and if the terms of the contract prescribed by the Board should not seem unduly onerous, the Metropolitan interests would be a competitor for the contract for its construction and operation. It thus appeared that at the close of 1903, and before the present railroad was completely constructed or under operation, there was before the Board the prospect of active competition by powerful interests for the right to construct and operate additional lines of rapid transit communication in the City of New York. Upon this result the Board feels that the citizens of New York are to be greatly congratulated.

PLANS FOR BROOKLYN AND QUEENS.

On March 12, 1903, the Chief Engineer of the Board presented his report in regard to the boroughs of Brooklyn and Queens. He made no report in respect to the borough of Richmond for the reason, as it is stated by him, that after very careful study of the problem he had become convinced that the great expense involved in attempting to connect that borough with the Borough of Manhattan was entirely out of proportion to the population to be served. The report is given in full in the report of the Chief Engineer.

After pointing out the extraordinary congestion at the Manhattan terminal of the present Brooklyn bridge, and the fact that in considering any plan for the relief of Brooklyn this question stands pre-eminent, he expressed the opinion that "some plan must be devised to bring the new bridges into harmonious relation with the transportation facilities." He therefore proposed the following method of dealing with this subject:

First.—To construct a subway to be carried under Nassau and Orange streets in Brooklyn and the East river to Maiden Lane in Manhattan; thence along William street, Centre street, Grand street, and private property to the end of the Williamsburgh bridge at Delancey street where the subway tracks, with but little alteration of the bridge structure, could be connected with the elevated tracks on the bridge. This was intended to provide a loop for the elevated railroads of Brooklyn by way of the Williamsburgh bridge and this second Brooklyn tunnel. Provision was to be made to connect the proposed subway with the elevated tracks on the Manhattan bridge when the latter is completed, thus providing a second loop.

Second.—The elevated trains to be removed entirely from the present Brooklyn bridge and the trolley cars transferred from the roadways to the original bridge tracks, thus restoring the roadways to the exclusive use of vehicles.

Third.—To connect the Second Avenue Elevated Railroad in Manhattan with the elevated structure of the Williamsburgh bridge and allow the construction of a temporary connection with the Brooklyn bridge, thus permitting the immediate operation of a continuous loop.

Fourth.—An extension of the present subway from Flatbush and Atlantic avenues, along Flatbush avenue to the Prospect Park and Plaza, and ultimately further in the same direction.

Fifth.—Another extension of the present subway from Flatbush and Atlantic avenues, southerly along Fourth avenue to Fort Hamilton.

Sixth.—A tunnel from Atlantic avenue in Brooklyn, to Whitehall street in Manhattan.

Seventh.—An extension and development of the Brooklyn

Rapid Transit elevated system in various directions, especially towards Long Island City to a connection with the Blackwell's Island bridge, and also along Third avenue and Fifth avenue southerly.

The problem of how to deal with the traffic over the Brooklyn bridges was also considered by the Board in connection with the Bridge Commissioner, who, on September 9, 1903, transmitted to the Board a copy of his recommendations on the subject, "to the end that the plans for rapid transit on both sides of the East river might be brought into harmony with track arrangements over the four East River bridges." His recommendations were briefly as follows:

1. To extend the elevated tracks on the Williamsburgh bridge along Delancey street to a terminus at Elm street.

2. To instal a moving platform on the Williamsburgh bridge upon the space set apart for two tracks of trolley cars.

3. To retain the elevated tracks on the Brooklyn bridge, connecting them with the elevated structure on Park Row, and carrying that ultimately to the Manhattan bridge, thus affording a loop.

4. To extend one pair of tracks from the Manhattan bridge (which is to be constructed with four elevated tracks) along Canal street to West street, affording means of transfers to all north and south lines in the borough of Manhattan.

5. To connect all the elevated trains on the bridge structures with the elevated roads in Brooklyn.

6. In respect to the Blackwell's Island bridge, the Commissioner concurred with the Chief Engineer of this Board, that a connection should be made from the railroad tracks on that structure directly to the Second Avenue Railroad.

MOVING PLATFORMS.

The recommendation of the Bridge Commissioner in reference to a moving platform on the Wiliamsburgh bridge was related to a subject which had been for some time before the Board, and before the Commissioner. Early in the year gentlemen interested in the subject had proposed to the Bridge Commissioner the construction of a moving platform to run over the west end of the Williamsburgh bridge, along Grand, Centre, and William streets to Wall street, and then by some suitable connection to Hanover Square or Bowling Green. This was submitted by the Commissioner to the Board of Estimate and Apportionment, who transmitted it to the Rapid Transit Board.

It appeared that the device proposed was similar to that installed at the exhibitions in Chicago in 1893 and in Paris in 1900. It consists of moving platforms running parallel to each other, but at different speeds; so that passengers can step from a stationary platform to a moving platform, and from the first moving platform to another platform moving at a higher speed. On the last mentioned platform, seats could be installed. A public hearing on the subject was had by this Board, at which the device was fully explained, and moving pictures were exhibited showing the platform as it appeared in actual operation at the time of the Exposition in Paris.

The general subject was referred to a committee of this Board and very fully and carefully considered by it. To the plan in general, the committee was favorable; but it was thought desirable to consider several details in reference to the route in the borough of Manhattan so that it could not at all conflict with proposed or possible rapid transit railroads; and after the details of route were settled, there remained some question as to the legal methods of carrying the plan into execution.

Upon examination of the statutes, the counsel of the Board expressed themselves as being in doubt whether this Board could lay out a rapid transit route over a bridge. They said:

> "Our conclusion is that although it is not improbable that the Board has the power to lay out a rapid transit route over any one of the Brooklyn-Manhattan bridges, nevertheless, the better course will be, if the Board think that in any case it may be proper for it to exercise such a power, to ask the Legislature for the slight amendment of the Act which would put the power beyond question. It is to be considered that in view of the great labor and great expense attending the establishment of a rapid transit road, it is a

> practical and financial necessity to a contractor to know of a certainty that every part of the road is lawfully authorized; and, moreover, that while any doubt in this regard remains, there is involved the possibility of litigation, not to be set at rest until a decision of the Court of Appeals is secured."

REQUISITE LEGISLATION.

It thus appears that no new rapid transit construction of any large importance can be undertaken until legislation is secured covering two points, viz., the enlargement of the power of the City to borrow money for rapid transit construction, and the removal of the existing doubt as to the power of the Rapid Transit Board to lay out routes which should embrace the bridges belonging to the city. Both of these objects can be secured by very slight amendments to the existing Rapid Transit legislation.

The general subject, however, of the terms upon which municipal construction of rapid transit railroads in the city of New York should be constructed, became during the year 1903 the subject of some public discussion, and a measure known as the Elsberg Bill was introduced in the Legislature, which proposed some radical changes in the existing statutes. The question how far legislation ought to go was the subject of careful consideration by the Board. The points at issue are well stated in a letter from the late Mayor to the President of this Board from which the following extracts are taken:

CITY OF NEW YORK—OFFICE OF THE MAYOR.

March 12, 1903.

Hon. ALEXANDER E. ORR, *President, Board of Rapid Transit Railroad Commissioners:*

MY DEAR SIR—Referring to the interview which you have had with me, at the request and on behalf of the Rapid Transit Commission, with reference to legislation necessary to make possible further extensions of the subway system, it seems to me good judgment to try to make clear to the people of the City the exact problem to be dealt with.

The Rapid Transit Law proceeds upon the theory that the City shall perfect a franchise, which it shall then offer for sale, for a term of years, to some one who will first construct the railroad called for and then operate it. By the terms of the law, the contractor must agree to pay, as rental, at least the interest upon the bonds issued by the City against the cost of construction, and one per cent. in addition for a sinking fund. The contractor also furnishes the equipment. In order to make such a contract possible at a time when everything was experimental in this regard, the law also provided that the road and rolling stock thus constructed should be free from taxation. On the other hand, the roadway belongs to the City, and at the termination of the lease or franchise the road passes absolutely into the City's control. If the City then assumes control it pays for the equipment at its then value.

Under these provisions of the lay the original subway contract was entered into in February, 1900, and the contractor, Mr. John B. McDonald, undertook to operate the road to be constructed for a period of fifty years, with the option of an extension, by mutual agreement, of twenty-five years more.

At the outset it was supposed that the equipment required for satisfactory operation would cost about $7,000,000. It is now expected that the equipment will cost $17,000,0000. It is also rumored, although it is not definitely known, that the contractor's profit upon the construction of the subway, as distinguished from the operation of the railroad, will be approximately $6,000,000. When it is considered that, only three years ago, there were only two bidders for this franchise—Mr. McDonald being the lower by $4,000,000, and that he put up his check for $150,000 as security for his bid without knowing whether he could find any one to finance the contract—it is apparent that the change in the outlook as to underground roads that has come about in these three years is little less than phenomenal. This is even more clear when it is recalled that the Rapid Transit Commission tried in vain to interest the great railroad corporations and the leaders of finance in the undertaking.

The second contract entered into under the Rapid Transit Law was made last summer for the subway connecting the Manhattan end of the East River Bridge with the Battery, and by tunnel under the East river with Flatbush and Atlantic avenues, in Brooklyn. The estimated cost of this extension, including stations, as estimated by the Chief Engineer of the Rapid Transit Commission, was $9,000,000, and it is believed that the actual cost will not differ very largely from this sum The contract was let, nevertheless, for $3,000,000, upon a lease of the franchise for thirty-five years instead of fifty years, as in the first instance, with the same privilege of a further extension of twenty-five years with the City's consent. These figures, apparently, have but one interpretation, viz., that the estimated profit from operation of the railroad is great enough to justify the contractor in bidding something like $6,000,000 below cost. It is, perhaps, worth while to point out that the City saves on the second contract just what the contractor is supposed to have made out of construction under the first. * * *

Now we are considering the proposals of the Chief Engineer to piece out the subway, as originally planned for Manhattan and the Bronx, in order to make it more complete, by adding a section here and a section there; to unite the various bridges crossing the East river, and to develop the subway system of Brooklyn. The question, therefore, is a vital one, in view of the facts as I have outlined them, what sort of legislation should be had in order to secure for the City not only the increased facilities desired, but also its proper share of the results of the proposed outlay.

The Rapid Transit Law limits the sum that can be invested under it to $50,000,000, unless this sum is enlarged by act of the Legislature. It is clear, I think, that the Board of Estimate and Apportionment should be substituted in this respect for the Legislature, so that the City may use for subway purposes whatever sum the Board of Estimate and Apportionment may deem proper. But, when this has been said, there still remain very grave problems to be considered.

The Comptroller suggests that the freedom from taxation, which was originally thought necessary, is no longer either necessary or permissible. He also proposes that the City should be authorized to construct the subway on its own account, and to lease it, when constructed, to whom it will. So far as the question of taxation is concerned, I am inclined to agree with the Comptroller; and if the fragments of subway likely to be built in the near future were complete systems in themselves, I should also be inclined to agree, without reserve, to his second proposition. But the pieces of the subway proposed for Manhattan and the Bronx are mere fragments to make more complete the system created by the first contract, the control of which has passed from the City for fifty years. The connection of the bridges and the extension of the Brooklyn subway system are equally dependent on existing facilities that are in private control for their greatest usefulness. I am apprehensive that the City might build any one, or all, of these sections, and find no lessee to operate them, except the company controlling what would be in each case the main system. Were the City to build under these circumstances, such company might be able to command the use of the City's subways practically upon its own terms—for, if the subways were constructed, the public demand that they should be immediately used would be irresistible, and the City might or might not be able to make a proper contract with the only company that could operate them at a profit and for a single fare. On the other hand, if the City's subway system is to be not only constructed in fragments, but operated by different companies, it is certain to be increasingly difficult to secure a single fare over all parts of the system, and universal transfers, even over the City's own lines. There remains to be considered, nevertheless, the fact that the contractor's profit on the construction of the first section is believed to be very large. It may be desirable, therefore, to secure competition in construction, even if competition in operation is not to be had. I am inclined, therefore, to suggest that the City be given the option to construct additions to the subway system on its own account, provided that before it enters upon any such construction it shall have made a satisfactory contract for the use of the piece of road to be constructed by it. * * *

Four things seem to me to be absolutely essential: I. A uniform rate of fare over every mile of the road built by the use of the City's credit, from one end of the City to the other. II. That this uniform rate of fare, at first to be five cents, shall be reduced as rapidly as circumstances will permit. III. That, year by year, while the control of the City's system is in private hands, the City shall receive as large a percentage as possible of the earnings of the road. IV. That the City, and not the railroad, shall dictate the character of service to be given. * * *

Bearing these requirements in mind, it may as well be taken for granted that the only bidder who is in a position to give to the City a uniform rate of fare over the entire system to be built with the City's credit is the Interborough Rapid Transit Company, which already controls the original subway and the first Brooklyn tunnel. I think amendments to the law may as well frankly recognize this fact and give to the City an option, by an amendment of section 32, to make contracts with this company, from time to time, for the extension of the subway system upon the best obtainable terms, just as the law now gives the City authority to make contracts with existing railroad corporations. Separate systems may, of course, be laid down where this situation would apply to other corporations than the Interborough Rapid Transit Company. If the law should be so amended, the law should also provide for the examination of every such company's books by representatives of the City, and for a reduction of the rate of fare whenever the profit warrants it.

The law should also provide, in my judgment, for the termination of all contracts at the same date as the first contract, which runs for fifty years, thus bringing the entire system under the control of the City at the same time. There is very slight advantage to the City in coming into possession of fragments of a system at different times. On the other hand, the law should also provide for periodic readjustment of the terms upon which the franchise is to be enjoyed, at intervals not exceeding twenty-five years. In other words, I would apply to these franchises, having fifty years to run, the same principle of periodic revision of terms which has recently been applied to the Pennsylvania franchise, which was granted in perpetuity. In the matter of taxation, I have this suggestion to make: The power houses are already subject to taxation, like other real estate; that which is not taxed is the franchise and the rolling stock, and what we call the interior equipment of the subway. The subway itself should not be taxed, for it belongs to the City. I venture the suggestion that every future extension of the road should be subject to taxation, during the term of the franchise, on the basis of the amount of money which the City is called upon to provide in order to secure such extension. Thus, if the City issues bonds for $5,000,000 in order to secure a given extension, that extension would pay taxes on an assessed valuation of $5,000,000 for the whole term of the contract; if the City issues only $1,000,000 of bonds, taxes would be paid on only $1,000,000; and, if the contractors furnished their own money, so as to make no demand upon the City, they would pay no such tax. But, in this event, the City would own the road, at the end of the franchise, without having used its credit at all in order to secure it. The effect of such a provision, I think, would be greatly to limit the demands made upon the City's credit, and it might easily be, in some conditions of the money market, that the operating company would finance the cost of this extension, or of that, on its own account; at all events such a provision as to taxation would have the advantage of making the amount of taxes a fairly ascertainable quantity, thus removing from the domain of bargaining an element that might otherwise be of great uncertainty.

This discussion is based, primarily, upon Mr. Parsons' suggestion as to Manhattan and The Bronx. It is practically certain, however, that the connection and use of the East river bridges will require similar co-operation from the Brooklyn Rapid Transit Company, and all future extensions of the subway system in Brooklyn must command the like co-operation either of the Interborough Rapid Transit Company or of the Brooklyn Rapid Transit Company. In other words, unless the City's transit system is to be broken up into fragments, with duplicate fares and conflicting management, there must be co-operation between the City and the private companies concerned. I think the real interests of the City require that this co-operation should be sought upon terms that protect the interests of the public as perfectly as good judgment can devise; and, if successfully sought, I think it will mean within a few years a single fare from one end of the City to the other over all roads, both public and private.

In suggesting to you these suggestions in this form I have done so in the hope that they will evoke general criticism. The question is too important to be approached by anybody otherwise than with an open mind. That, at least, I assure you, is the spirit in which I approach it, and the spirit in which these suggestions are made.

Yours very truly,

SETH LOW, Mayor.

II.

GRANTS OF FRANCHISES.

PENNSYLVANIA FRANCHISE.

As stated in the report of this Board for 1902, the certificate granting this franchise was approved by the Board of Aldermen on December 16, and by the Mayor on December 23, 1902. By its terms the franchise was to become void unless the company, within a limited time, secured the consents of the several municipal authorities, and also the consents of the abutting property owners along their line, or (if such consents of property owners could not be obtained) of the Supreme Court.

Delays necessarily incident to so great and novel an enterprise have occurred; but before the close of the year 1903, all the necessary steps had been taken with the exception of obtaining consents for the use of the portions of streets and avenues in the borough of Queens where the railways approach the surface, near the intersection of Thompson avenue and Purves street. The reason why these consents were not obtained was stated by the company to be that they had not yet been able to perfect plans for necessary terminals and facilities required in connection therewith, and were therefore unable to determine whether any, and if so, what, consents or procedure would be necessary.

In view of the company's statements, this Board has extended the time of the company to procure the necessary consents for changes in the borough of Queens until May 28, 1904.

New York and Jersey Franchise.

As stated in the report of this Board for 1902, this certificate was also approved by the Board of Aldermen on December 16 and by the Mayor on December 23, 1902. It contained, among other things, the provision "that all plans for, and the method of doing the work, shall from time to time be subject to the approval of the Board." Under this provision the company submitted plans and specifications showing methods of construction which, with certain changes, were approved by this Board.

The New York and Jersey Railroad Company duly obtained the consent of the municipal authorities and also the consents of the owners of a sufficient amount of property, with the exception of the property abutting upon the line of the road in West 10th street. In view of the difficulty of getting such consents, the time of the railroad to obtain them was extended by this Board.

Hudson and Manhattan Franchise.

On May 28, 1903, an application was received from the Hudson and Manhattan Railroad Company for a franchise to construct a tunnel from a point at or near the intersection of Broadway and Cortlandt streets in the orough of Manhattan to the boundary line between the cities of New York and New Jersey, opposite a point lying between Liberty and Fulton streets in Manhattan. The Committee of the Board on Contracts made the following report in reference to this subject:

No. 320 Broadway, New York, 9th July, 1903.

To the Board of Rapid Transit Commissioners:

Your Committee, to which was referred the application of the Hudson and Manhattan Railroad Company, respectfully reports that, in its opinion, the application should be granted upon proper terms. Your Committee has prepared the form of franchise herewith submitted, including terms which the Committee consider to be proper. The Railroad Company is prepared to accept such franchise, and in the opinion of your Committee it is to the interest of the City that it should be granted.

Your committee has received satisfactory assurance of the pecuniary responsibility of the Railroad Company, and submits herewith the letter of W. G. McAdoo giving details upon that subject. The essential features of the proposed franchise are these:

First—A grant by the City in perpetuity and subject to periodic adjustment of payments to the City at intervals of twenty-five years each of rights as follows:

(a) To construct and operate a railroad for the carriage of persons and property, consisting of two tracks, beginning at a point in the boundary line between the States of New York and New Jersey, under the Hudson river, opposite the foot of Cortlandt street, in the Borough of Manhattan, and thence proceeding easterly under the river and dock and bulkhead property to West street, at the foot of Cortlandt street; thence crossing under West street and proceeding under and along Cortlandt street, crossing under Washington and Greenwich streets, to a point in Cortlandt street west of and near the westerly line of Church street, and thence curving northerly under private property and crossing under Dey street and thence again under private property to Fulton street, west of and near the westerly line of Church street; thence curving to the west into Fulton street, and thence proceeding under and along Fulton street, crossing under Greenwich, Washington and West streets, and under dock and bulkhead property and under the Hudson river, to a point in the boundary line between New York and New Jersey nearly opposite the foot of Fulton street.

(b) To maintain a terminal station in the easterly portion of the blocks bounded by Greenwich, Cortlandt, Church and Fulton streets, in the said Borough, the same being private property, and to use for such terminal and station and tracks and for sidings and connections, the underground portions of Cortlandt, Dey and Fulton streets contiguous to such terminal.

(c) To maintain a subway for foot passengers from such terminal under and along Dey street, crossing under Church street and Broadway to John street, so as to connect at Broadway with the station of the Brooklyn-Manhattan Rapid Transit Railroad.

(d) To run upon the railroad motors and cars and to use thereon all suitable railroad appliances, also to maintain and operate telegraph wires, cables, conduits and ways for distribution of power, heat and light, and other appurtenances for use of the railroad.

But such grant to be subject to the limitation and conditions hereinafter prescribed.

Second—The requirement of the consent of the proper municipal authorities and also of abutting property owners on the street or the consent of the Supreme Court in lieu of such consent of property owners.

Third—The obligation of the Company to begin construction within three months after obtaining the necessary consents, and to complete the railroad within five years after construction shall begin.

Fourth—Payments by the Company to the City for the first twenty-five years as follows:

(a) A charge of $100 per annum for the right to enter the City, including the approaches from the west to the pier line.

(b) A charge for the right within the pier line and for underground portions of streets and for the passenger subway under Dey street and Broadway at the rate of 50 cents per linear foot of single track or subway per annum for the first ten years, and of $1 per annum per linear foot during the next fifteen years.

(c) A charge for the underground portions of Cortlandt, Dey and Fulton streets near the terminal station, and where the Company's tunnel construction comes within 16 feet and 8 inches of the surface, at the rate of 40 cents per superficial square foot per annum for the first ten years, and of 80 cents per annum per superficial square foot for the next fifteen years.

(d) A further annual sum for tunnel rights under the street of 3 per cent. of the gross receipts of the New York portion of the railroad for ten years and 5 per cent. for the next fifteen years. Such gross receipts are fixed for the first twenty-five years at $300,000 per annum, whether in fact such gross receipts shall be more or less.

Such annual payments are estimated by Mr. McLean, the Comptroller's expert, as follows:

Schedule.

	FIRST 10 YEARS.	NEXT 15 YEARS.
For entrance or river right	$100 00	$100 00
For rights under dock property, streets in Manhattan and for the passageway to the easterly side of Broadway (on the estimated basis of 3,650 feet of single track and 520 feet for the passage way) at 50 cents per foot per annum for 10 years and $1 per annum for the next 15 years	2,050 00	4,100 00
For street or vault rights in Cortlandt, Dey, and Fulton streets contiguous to terminal station, estimated at 4,742 feet, at 40 cents per square foot per annum for 10 years and 80 cents per square foot per annum for the next 15 years	1,896 80	3,793 60
NOTE.—This is to be increased for the space under Cortlandt and Fulton streets and east of Greenwich street, where the railway approaches within 15 feet of the surface, such space being considered as vault space.		
Additional payment for tunnel rights under streets	9,000 00	15,000 00
In all, estimated per annum, but subject to increase as above	$13,046 80	$22,993 60

The amounts of the charges are to be readjusted at the end of twenty-five years. If the City and Company shall not then agree, the readjusted rates are to be determined by the Supreme Court.

Fifth—The railroad to be entirely in tunnel except at the terminal station, which is to be on property privately owned or controlled by the Company, and is to include, besides, the underground contiguous portion of Cortlandt, Dey and Fulton streets.

No part of the railroad structure except its terminal station shall approach within 5 feet of the exterior line of any street, and the uppermost part of the tunnel shall not approach nearer than 16 feet 8 inches to the surface of any street, except that in Cortlandt and Fulton streets, between the easterly side of Greenwich street and the terminal station, the tunnel may, according to grade necessity, approach to within not less than 3 feet and 6 inches of the surface. The Company to properly care for sewers, water, gas and other underground structures lawfully in the street, and at its own expense to keep properly paved the portion of Dey street contiguous to its terminal station. The subway for foot passengers under Dey street and Broadway not to exceed in width over all 15 feet, and no part of it to approach within nearer than 24 feet to the surface of the street, such subway to be placed wherever in the street shall be required by the Board. The Board and the City to have the right to alter the location of such subway, or if it should be needed for municipal purposes to entirely close it, and in case of entire closing no allowance to be made to the Company except the abatement of the charge per linear foot for such subway.

Sixth—The Company to make good all damage done to property of the City and to make good to abutting owners all damage resulting from any fault or negligence of the Company, or of any contractor or employee in the construction or operation of the railroad.

Seventh—Tunnel excavation to be done without disturbing the surface of the streets, except the portions of Cortlandt and Fulton streets adjoining the terminal; but the Board may, wherever local conditions make surface excavation necessary for efficient construction, permit such excavation. The tracks to be of the most approved plan to avoid noise or tremor. The plans and methods of doing the work to be subjet to the approval of the Board.

Eighth—The motive power to be electricity or such other power not involving combustion in the tunnel as may be approved by the Board.

Ninth—The Company to have no power to carry on local traffic.

Tenth—The railroad to be diligently and skilfully operated with due regard to the convenience of the traveling public.

Eleventh—The City to have a lien upon the franchise and real property of the Company under the river and streets to secure payment of rental charges.

Twelfth—The rights of the City to be enforceable by action for specific performance, mandamus or otherwise.

Thirteenth—The Company not to oppose, but upon the request of the Board to consent to, the construction of any rapid transit railroad over, along or under any portion of any of the streets to be occupied by the railroad, which shall not actually interfere with the structure authorized by the franchise.

Fourteenth—The City to have ample right of inspection and of entry upon the railroad.

Fifteenth—The Company to so strengthen all parts of its railroad under streets as that the same shall support safely any structure superimposed by public authority.

Sixteenth—The Company to have the right to convey or mortgage the franchise, but every grantee, whether directly or under the mortgage, to assume the obligations already assumed by the Company; and no grant to relieve the Company of its obligation.

The Board will observe that in general this franchise follows closely the franchise already granted to the New York and Jersey Railroad Company, the terms of which were minutely and carefully considered by the Board; and this Committee needs to add little to what was said in its report to the Board, dated July 1, 1902, upon that franchise.

Substantially the same justification for a perpetual grant exists in this case as existed in the New York and Jersey case. The tunnel authorized by this franchise at the west ends at the boundary line between the States of New York and New Jersey; and from that line west the tunnel must be continued under the authority of New Jersey. It is obvious that the New York grant is susceptible of use only in connection with the New Jersey part of the tunnel under the Hudson river. If the New York grant were limited, then at the end of the limited term the grant would be of no use or advantage to the City. A readjustment of rental charges at twenty-five year intervals will, in cases like this, give the City all the practical advantage of a limitation of the life of the grant.

The charge per square foot for vault spaces is 40 cents for the first ten years and 80 cents for the next fifteen years, as against 11 cents and 22 cents for the same period in the New York and Jersey franchise. But the theory upon which the charges are settled is the same in each case. In the present franchise the abutting property is of proportionally larger value than was the abutting property upon Greenwich, Christopher and West Tenth streets in the New York and Jersey franchise. The theory of the Board is that the street spaces should be valued relatively to the value of the abutting property.

The Tunnel Company has desired, and it is the interest of the traveling public, that there should be easy communication between the Company's terminal station and the proposed rapid transit station at Broadway and Dey street. This can be accomplished only by a subway for foot passengers extending from the Company's terminal station on the west side of Church street under Dey street to the subway station on the west side of Broadway, and under Broadway to the subway station on the east side of Broadway. The Committee, however, does not think that the City should be absolutely committed to this grant. The proposed franchise provides, therefore, that in case any municipal necessity shall arise, then upon the requirement of the Board or the City, the location under the streets of such passenger subway shall be changed, or, if necessary, such subway entirely closed and surrendered. So long as a footway is used the Company will pay for it at the same rate as for a single track of railroad.

Respectfully submitted,
A. E. ORR,
CHAS. S. SMITH,
EDWARD M. GROUT,
Committee.

The Board devoted much time and attention to the form of the certificate to be granted to this company, and on November 24, 1903, adopted a form of certificate which was acceptable both to the members of this Board and to the railroad company. As finally adopted, the certificate was transmitted to the Board of Aldermen on November 30, 1903, with the following communication:

To the Honorable the Board of Aldermen of The City of New York:

The Hudson and Manhattan Railroad Company, hereinafter called the Tunnel Company, is a railroad corporation incorporated under the laws of the State of New York, for the purpose of constructing and operating a tunnel railroad in The City of New York, to be connected with a railroad or railroads within the State of New Jersey, and thereby forming a continuous line for the carriage of passengers and property between a point or points within and a point or points without the City, and more particularly a tunnel railroad having its eastern terminus in the easterly portion of the blocks bounded by Greenwich, Cortlandt, Church and Fulton streets, in Manhattan Borough in the said City; and thence extending westerly, and to be connected with a railroad or railroads in the State of New Jersey, and thus forming a continuous line for the carriage of passengers and property between such easterly terminus of the said railroad of the Tunnel Company within the City and points along the lines of such railroads in the State of New Jersey.

The Tunnel Company, pursuant to section 2 of chapter 4 of the Laws of 1891, as amended by chapter 584 of the Laws of 1902, which entire statue, as amended by various acts, as is now in force, is hereinafter called the Rapid Transit Act, made application to the Board of Rapid Transit Railroad Commissioners for the City of New York, for authority to lay railroad tracks along a certain route within the City, and to have and maintain therein a terminal station, and to acquire in the City terminal and other facilities necessary for the accommodation of the traveling public, and to construct and operate its railroad along the said route and under lands, streets, avenues, rivers, highways and public places in the City, with necessary sidings, platforms, stations, facilities for access to the surface and other appurtenances, and with the right to emerge to the surface upon private lands at the terminus thereof in Manhattan Borough, all as set forth in the certificate dated November 24, 1903, hereinafter more particularly referred to, and to transport over the said railroad passengers or freight, or both. The Board on the 24th day of November, 1903, by a concurrent vote of more than six of its members, as follows: Alexander E. Orr, John Claflin, Woodbury Langdon, Charles Stewart Smith, Morris K. Jesup, Seth Low, Mayor, and Edward M. Grout, Comptroller, fixed and determined the locations and plans of construction of said railroad of the Tunnel Company upon such route, and all such tracks and facilities, the times within which they shall be respectively constructed, and the compensation to be paid therefor to the City by the Tunnel Company, and also prescribed such terms, conditions and requirements as to the Board appeared to be just and proper for the grant in question, including the terms, conditions and requirements provided by the Rapid Transit Act, and including among them a provision that the Tunnel Company shall, from the time of the commencement of the operation of such railroad, under the determination of the Board, annually pay to the City a sum or rental for a period of twenty-five years, beginning with such operation, and also providing for a readjustment of the amount of such sum or rental at the expiration of such period, and at intervals thereafter of twenty-five years. The said locations, plans of construction and compensation to the City, and terms, conditions and requirements are fully set forth in the certificate dated November 24, 1903, a copy of which is transmitted herewith. A copy of a written instrument, duly executed and acknowledged by the Hudson and Manhattan Railroad Company, accepting the franchise contained in the said certificate, and all the terms, conditions and requirements thereof, is annexed to said certificate, and is also transmitted herewith. The views of the Board, with reference to the aforesaid application and certificate, are stated in the communication to the Board dated July 9, 1903, made by a Special Committee of the Board, composed of Alexander E. Orr, Chairman; Charles Stewart Smith and Edward M. Grout, Comptroller, a copy of which is transmitted herewith. Since such report was made, the form of franchise has been changed in two respects only, there having been added to Article IX. a provision, as follows:

> "In case at any time, in the opinion of the Board, the Tunnel Company shall fail to carry out the foregoing provision, in any proceedings which may be instituted by any proper authority to compel a compliance therewith, the burden of proof shall be upon the Tunnel Company to show that it is discharging the duties and obligations imposed by this section."

This has been added in order that if and where there shall be any controversy whether the holder of the franchise performs its full duty to the public, the public shall have the advantage of devolving the burden of proof upon the holder of the franchise.

The other change has been in adding to Article XIV. a provision which puts it beyond doubt that, in case of any merger of a corporation owning the franchise, the new or consolidated or merged corporation shall be subject to all the obligations of the franchise.

The Board believes that it is for the interest of the public and of The City of New York that the necessary constitutional consents to the construction and operation of the said railroad of the Tunnel Company should be obtained as soon as possible.

In witness thereof, the Board of Rapid Transit Railroad Commissioners for The City of New York has caused its official seal to be hereto affixed, and these presents to be signed by its President and Secretary, this 1st day of December, 1903.

BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS FOR THE CITY OF NEW YORK,

A. E. ORR, President.

BION L. BURROWS, *Secretary.*

The certificate was approved by the Board of Aldermen on December 22, 1903, and by the Mayor on December 29, 1903.

The complete form of the certificate will be found in the appendix.

NEW YORK CONNECTING RAILROAD COMPANY.

On June 11, 1903, a communication was presented from this company asking for a right to extend its lines under the provisions of §32 of the Rapid Transit Act. It appears from the statements made that this company owns a railroad lying wholly within the limits of The City of New York, having its termnius in the Borough of Queens. The stock of this company is owned jointly by the Pennsylvania Railroad Company and the New York, New Haven & Hartford Railroad Company.

Arrangements have been made by them for a through line of railroad for the transportation of freight and passengers via the new tunnel line extending from New Jersey through and under the North river, the Borough of Manhattan, the East river, to the Borough of Queens. Freight is also to be carried by ferry from Greenville, New Jersey, to Bay Ridge, and thence to the Connecting Railroad. The applicant proposed an extension from the present terminus in Queens over the East river and over Ward's and Randall's Islands to a point of connection in the borough of The Bronx with the railroad of the New York, New Haven and Hartford Railroad Company.

This application is still under examination by the Board.

III.

PROGRESS ON MANHATTAN-BRONX RAILROAD DURING 1903.

The report of the Chief Engineer hereto appended sets forth fully the process of the work of construction.

The total amount expended for work done and materials furnished under the contract up to January 1, 1903, was	$23,464,000
The amount so expended during the year 1903 was	6,930,000
Making a total expenditure to date of	$30,394,000

As the contract price is $35,000,000, and as the payments under the contract are made according to the proportion of work done and materials furnished, it appears that at the close of 1903 the contractor's work was nearly 90 per cent. completed.

This work would doubtless have been still further advanced if it were not for serious delays caused by strikes both upon the subway itself and also upon the power house and other equipment, which the contractor is bound to supply at his own expense.

During the progress of the work many troublesome questions have arisen in connection with the acquisition of rights of way under private property.

Condemnation proceedings were resorted to in order to secure such easements at Eighth street and Park avenue and at 103rd street and Broadway. At the north-east corner of 42nd street and Broadway an arrangement was made with the owners of the fee, but it became necessary to resort to condemnation proceedings to determine the rights of their tenants; and as the building at this point had to be taken down and then rebuilt, great difficulty was experienced in adjusting the rights of the several parties.

At the corner of Park avenue and 42nd street, and at the north-westerly corner of 42nd street and Broadway, the necessary easements were purchased from the owner, the Subway Realty Company.

At other points the Interborough Rapid Transit Railway Company has purchased the land, under an agreement with this Board substantially to the effect that during the year 1904 the land shall be sold subject to the right of way; and that the difference between the original cost of the land, and the price realized on such sale, shall be paid by the city as the cost of the easement. The places as to which such an arrangement has been made are:

104th street, east of Broadway (Manhattan).
141st street and Lenox Avenue (Manhattan).
149th street and Harlem river (Bronx).
Hillside and Eleventh avenues (Manhattan).

At various points along the route, requests have been received from the owners of property abutting on stations that they might be permitted to open a doorway from their premises directly on to the station platforms. Arrangements to this effect have been made in connection with the acquisition of rights of way through private property at the 8th street and Fourth avenue, 42nd street and Park avenue, and 42nd street and Broadway Stations. It is believed that these passageways will prove a great convenience to the traveling public, while an undoubted advantage to the business property into which they lead.

The City in making the arrangements above referred to, has received a consideration in connection with the grants of rights of way. But similar applications have been made at points where the subway lies wholly within the street; and in such cases questions of a different character arise. The Board has now under consideration the adoption of some rule as to compensation to The City for the right to make entrances from private property to rapid transit stations.

THIRD TRACK ON THE UPPER WEST SIDE.

As stated in the report for 1902, the contractor requested authority to construct an extra third track from the north portal on the west side line of the Manhattan-Bronx road near Fort George to the southern terminus at Kingsbridge. On January 15, 1903, the Board authorized the construction of an additional track along this portion of the road, upon condition that the cost should not exceed $185,000 and that the work should be done and paid for as extra work under the contract, and that rental should be paid by the contractor in all respects as if the additional track in question had been originally authorized by the contract for construction and operation.

WESTCHESTER AVENUE CONNECTION.

Reference has already been made to the proposed connection between the rapid transit railroad on Westchester avenue and the existing elevated railroad on Third avenue at 149th street. The advantage of such a connection is that through trains can be operated from a point near the Bronx Park by a direct line to all points south of the Harlem river connecting the South Ferry and City Hall by the elevated railroads. Passengers along the Lenox avenue line of the present subway would thus have better service because the Lenox avenue line would be relieved of some part of the traffic from the northeastern portion of The Bronx.

As this proposed addition involved a new route, it was necessary to obtain the approval of the municipal authorities. Accordingly, a communication was addressed to the Board of Aldermen, recommending the approval of the additional Westchester avenue connection as follows:

To the Honorable the Board of Aldermen of The City of New York:

The Board of Rapid Transit Railroad Commissioners for The City of New York heretofore and on or about the 4th day of February, 1897, submitted to the Common Council of The City of New York as then constituted a report with respect to the proposed rapid transit railroad in the said City.

Since the said report was made the routes and general plan for the rapid transit railroad above mentioned have ben duly approved by the municipal authorities of The City of New York and by the Appellate Division of the Supreme Court for the First Judicial Department, and on the 21st day of February, 1900, a contract for the construction and operation of said rapid transit railroad was duly made with John B. McDonald, contractor, by The City of New York, acting by the said Board. The said contractor is now engaged in the construction of the said railroad pursuant to the terms of said contract.

The said contractor desires, and the said Board having duly made the inquiries and investigation proper in the premises, approves an addition to the routes and the general plan for the said railroad as heretofore adopted (such addition being known as the Westchester avenue connection), and has determined and established the addition by resolution adopted July 16, 1903, of the concurrent vote of six of its members, and for the purpose of the said addition has duly entered into an agrement with the said contractor bearing date the 16th day of July, 1903. A copy of the said agreement containing the resolution of July 16, 1903, is hereto annexed.

The said resolution of July 16, 1903, and the addition to the routes and general plan therein mentioned are now submitted to your Honorable Board for approval if it shall see fit to approve the same.

This addition to the original route will connect at Third avenue and One-Hundred and Forty-ninth street and the East Side line of the Manhattan-Bronx Railroad, now being constructed by the City, with the Third avenue line of the Manhattan Elevated Railroad Company. Since the routes and the general plan were adopted the Interborough Rapid Transit Company, to which has been assigned the lease for the operation of the Manhattan-Bronx Railroad, has acquired and is now operating the Manhattan Elevated Railroad system, and such connection is now possible and, in the opinion of this Board, most advantageous to the traveling public. Provision has been made in the contract that a passenger traveling on the Manhattan-Bronx Railroad from the north shall have the choice, without additional fare, of continuing south on the Manhattan-Bronx Railway or upon its proposed addition, and thence southerly upon the Third avenue line of the Manhattan Railroad Company; and that a passenger traveling north upon the Third avenue line of the Manhattan Railroad Company shall have the choice, without additional fare, of continuing north on said line or continuing easterly upon the said proposed addition, and thence along the Manhattan-Bronx Road, Westchester avenue, to the northeasterly terminus.

In witness whereof this Board has caused its seal to be hereto affixed and these presents to be witnessed by its President and Secretary this 6th day of October, 1903.

A. E. Orr, President,
Bion L. Burrows, Secretary.

The proposed additional route on Westchester avenue was approved by the Board of Alderman on December 15, 1903, and by the Mayor on December 22, 1903. Efforts to obtain the approval of the abutting property owners were not successful, and it was therefore necessary to apply to the Appellate Division of the Supreme Court for authority to construct this addition. Such authority, it is hoped, will shortly be obtained.

FORT LEE FERRY EXTENSION.

On June 24, 1903, the Interborough Rapid Transit Company informed the Board that it had made an arrangement with the company operating Fort Lee Ferry, by which passengers could be carried over the Rapid Transit Railroad and the ferry for a single fare of five cents, provided an elevated railroad could be constructed to connect the rapid transit viaduct with the ferry.

The advantages of such an extension were so apparent to this

Board that it had little difficulty in agreeing to the construction of the proposed extension, and in entering into a contract for its construction and operation as an extension of the present rapid transit railway. As the extension involved the use of Manhattan street, it was of course necessary to obtain the consents of the municipal authorities and the abutting property owners.

The following communication was therefore addressed to the Board of Aldermen:

To the Honorable the Board of Aldermen of The City of New York:

The Board of Rapid Transit Railroad Commissioners for The City of New York heretofore and on or about the 4th day of February, 1897, submitted to the Common Council of The City of New York, as then constituted, a report with respect to the proposed Rapid Transit Railroad in the said City.

Since the said report was made the routes and general plan for the Rapid Transit Railroad above mentioned have been duly approved by the municipal authorities of The City of New York and by the Appellate Division of the Supreme Court for the First Judicial Department, and on the 21st day of February, 1900, a contract for the construction and operation of said Rapid Transit Railroad was duly made with John B. McDonald, Contractor, by The City of New York, acting by the said Board, The said Contractor is now engaged in the construction of the said railroad, pursuant to the terms of said contract.

The said Contractor desires, and the said Board, having duly made the inquiries and investigation proper in the premises, approves an addition to the routes and general plan for the said railroad, as heretofore adopted (such addition being known as the Fort Lee Ferry Extension), and has determined and established the said addition by resolution adopted July 16, 1903, by the concurrent vote of six of its members, and for the purpose of said addition has duly entered into an agreement with the said Contractor bearing date the 16th of July, 1903. A copy of the said agreement containing the resolution of July 16, 1903, is hereto annexed.

The said resolution of July 16th, 1903, and the addition to the routes and general plan therein mentioned are now submitted to your Honorable Board for approval, if it shall see fit to approve the same.

This additional route is approved by this Board, because, in its opinion, this connection between the Manhattan Street Station of the west side line of the Manhattan-Bronx Railroad, now being constructed by the City, and the entrance to the ferry operated by the New Jersey and Hudson River Ferry Company at the foot of West One Hundred and Thirtieth street will be of of great convenience to the traveling public.

This Board has been informed that the Interborough Rapid Transit Company, to which has been assigned the lease for the operation of the Manhattan-Bronx Railroad, has made arrangements with the Ferry Company for the improvement of the ferry service.

In witness whereof this Board has caused its seal to be hereto affixed and these presents to be witnessed by its President and Secretary this 6th day of October, 1903.

A. E. ORR, President.
BION L. BURROWS, Secretary.

The proposed Fort Lee extension was neither approved nor disapproved by the Board of Aldermen before the close of the year, so that it became necessary to resubmit the matter to the new Board, which was to come into existence on January 1, 1904.

PARK AVENUE DEVIATION.

This Board in its report for 1902 gave the history of certain litigation which had for its purpose the closing of the easterly tunnel on Park avenue, between Thirty-fourth and Forty-second streets, on the ground that this was not built on the lines authorized by the municipal authorities and the Supreme Court.

The latest judicial utterance on the subject, to which reference was made in the former report, was the opinion of MR. JUSTICE LEVENTRITT at Special Term, in which he expressed himself as satisfied "that there has been in this section of Park avenue a substantial and as yet unauthorized deviation from the established plan." Nevertheless, the learned Judge declined to grant an injunction, placing his decision on grounds affecting the public safety and the public interest. He said:

> "The slight injury to the plaintiff is quite lost in the magnitude of the public improvement and the large public need. Quite a different question might be presented if the illegality complained of were incurable. If the entire con-

> struction were unauthorized and could never be validated, the plaintiff, upon adequately showing irreparable damage peculiar to himself, might see his rights rise paramount even in this form of action. But the deviation from the established plan can be made legal. Failing to obtain consent of the property owners, application may be made to the Appellate Division to sanction the departure from the original plan. The preliminary steps to this end have been taken and the affidavits contain the assurance that the proper form of application is about to be made. While the court will ordinarily concern itself with existing facts, I believe I am justified, in view of the public interests involved, in taking the ultimate and probable correction of the unsanctioned step into consideration."

In accordance with this intimation the Board resolved, on April 16, 1903, that the Easterly tunnel section on Park avenue between Thirty-third and Forty-second streets should be modified so as to conform to the line of the road as actually constructed. This resolution was transmitted to the Board of Aldermen with the following communication:

Office of the Board of Rapid Transit Railroad Commissioners, for the City of New York,

320 Broadway, New York City.

To the Honorable the Board of Aldermen of The City of New York:

The Board of Rapid Transit Railroad Commissioners of The City of New York heretofore and on or about the 4th day of February, 1897, submitted to the Common Council of The City of New York as then constituted, a report with respect to the proposed Rapid Transit Railroad in the said City.

Since the said report was made the routes and general plan for a rapid transit railroad, therein mentioned, have been duly approved by the local authorities of The City of New York and by the Appellate Division of the Supreme Court for the First Judicial Department, and on the 24th day of February, 1900, a contract for the construction and operation of said Rapid Transit Railroad was duly made with John B. McDonald, Contractor, by The City of New York, acting by the said Board. The said contractor is now engaged in the construction of the said railroad pursuant to the terms of said contract. Along that portion of the route under Park avenue the tunnel has been constructed and, as was believed, in conformity with the said routes and general plan, in two sections, a westerly tunnel section and an easterly tunnel section, each tunnel section containing two tracks.

The said Board, having made the inquiries and investigation necessary or proper in the premises, has determined, in order that the validity of the present construction of the tunnel under Park avenue may be established beyond any question, that a modification and amendment of the said routes and general plan is necessary for the interests of the public and of The City of New York, and has determined and established, subject to the consents and approvals necessary to be first obtained, the said routes and general plan as so modified and amended by resolution of April 16, 1903. A copy of the said resolution is hereto annexed.

The easterly tunnel section under Park avenue described in the modification and amendment to such routes and general plan is now substantially complete. Its construction was begun along the present site late in the year 1900, and with but slight interruption it was continued until its substantial completion in February, 1903. The excavation and the mason work, walls and roof are finished and the only remaining work necessary to fit such easterly tunnel section for its final uses consists of the preparation of the roadbed and the laying of the rails. The City has already expended upwards of six hundred thousand dollars ($600,000) in the construction of this easterly tunnel section. It has been the belief of this Board and its Chief Engineer and also of the Rapid Transit contractor and his Chief Engineer, and it is their present claim and position that the present site of such easterly tunnel section is within the scope of the text as well as of the general intention of the routes and general plan of the Manhattan-Bronx railroad as they were submitted to and approved by your Honorable Body or its predecessor in March, 1897. It was and is the view of this Board that the requirement of connections with the tracks and facilities of the Grand Central Station and the practical impossibility of permitting grade crossings in carrying out such requirements made necessary, and therefore justified, within the scope of the routes and general plan, the placing of the easterly tunnel section far enough to the east to permit the ultimate construction in Park avenue of three additional tracks between the present easterly tunnel section and the present westerly tunnel section, such three additional tracks to be carried underneath the two tracks contained in the present easterly tunnel section as they curve westerly from Park avenue into Forty-second street. But this view of the Rapid Transit Board was attacked in several law suits brought by property owners on the east side of Park avenue who sought injunctions to restrain the construction or use of the easterly tunnel section. The Rapid Transit Board and the City have thus far been successful in such litigations; but Mr. Justice Giegerich and Mr. Justice Leventritt of the Supreme Court of this State, and Judge Lacombe of the United States Circuit Court have expressed the opinion that such easterly tunnel section is not within the authority of the original routes and general plan. In view of the Board and its Counsel, these judicial expressions are not technically binding; but they represent the view of distinguished judges; and the Rapid Transit Board feels bound, and trusts that your Honorable Body will feel bound to defer to such expression. This Board has promised the Supreme Court that it would take this proceeding for the validation beyond doubt of the site of such easterly tunnel section; and it therefore submits the matter to your Honorable Board. It is proper to point out that if the site of the easterly tunnel section should not be thus validated, and if any court should hereafter hold that it cannot be used for rapid transit purposes, several most unfortunate results would follow. In the first place the City might lose its very large investment in construction of such easterly tunnel section. In the second place the City might incur a large expense in the construction of another easterly tunnel section. In the third place the operation of the rapid transit road would be delayed to a certainty for a period as great as one year, and, perhaps, for a much longer period.

The said resolution of April 16, 1903, and the modification and amendment of the routes and general plan therein contained are now submitted to your Honorable Body for approval.

In witness whereof, this Board has caused its seal to be hereto affixed and these presents to be witnessed by its President and Secretary, this 17th day of April, One thousand nine hundred and three.

A. E. Orr, President.
Bion L. Burrows, Secretary.

The Board of Aldermen approved the action of this Board by a resolution adopted June 2, 1903, and the same was signed by the Mayor June 11, 1903.

Application was subsequently made to obtain the consents of the property owners, and this effort failing, the necessary application was made to the Appellate Division for the appointment of Commissioners to determine whether this part of the subway ought to be operated. The order appointing Commissioners was entered on December 18, 1903, although opposed by property owners who claimed damages. The Court said:

> "We think that the motion to appoint Commissioners should be granted. In case such Commissioners report in favor of the petitioners, the rights of abutting owners to damages, etc., can be protected in the final order."

PROPOSAL FOR STATION AT CENTRAL PARK WEST.

Early in the year 1903 owners of property and residents in the neighborhood of 104th street and Central Park West strongly urged upon the Board the establishment of an additional station at that point. The reasons presented were that the distance of this point from the two nearest subway stations was too great to afford proper accommodation to the residents of the vicinity; that the large traffic on Central Park West would necessarily and naturally be tributary to such a station; and that an opening at or near this point ought to be provided as a place of exit in case of accident. The Board, while fully recognizing the force of this reasoning, was unwilling to undertake the work if it was likely to delay the opening of the road. It was also pointed out by the Chief Engineer that the existence of a local station at Central Park West would inevitably diminish the facilities afforded to persons using the Lenox avenue and Bronx line.

After careful consideration the Board decided not to construct the proposed station, in view of the opinion of the Chief Engineer and the Contractor that it could not be built without causing serious delay in the completion of the subway.

IV.

PROGRESS ON THE BROOKLYN-MANHATTAN RAILROAD IN 1903.

As stated in the report for 1902, work under this contract was formally begun on November 8, 1902. Little progress, however, was made during the remainder of that year. The work, however, is now being actively prosecuted and up to January 1, 1904, the payments authorized to be made on account of the contract were $202,457.06, or over 20 per cent. of the contract price. The details as to this work are fully stated in the report of the Chief Engineer appended hereto.

The methods of construction of the road in Brooklyn along Joralemon street have necessarily differed materially from those which have been employed in the borough of Manhattan, for two reasons: First, because the excavation is at a considerable depth below the surface, so that an open cut would be impracticable, and second, because even at this depth rock is not encountered, the material being a course sand or gravel. Excavation has, therefore, been by tunnel, a shield being driven substantially in the manner used for excavation under the rivers. As the result of this excavation there have been some regrettable disturbances of the surface along Joralemon street.

PIPE GALLERIES.

In connection with the construction of this railway along Broadway in the Borough of Manhattan, the Chief Engineer was requested in December, 1902, to take up with the municipal authorities the construction of pipe galleries over or at the side of the railway tunnel for the purpose of accommodating the various gas and sewer pipes, electric conduits, etc. In connection with the representatives of the President of the Borough of Manhattan, a plan for the construction of such pipe galleries was worked out. The Rapid Transit Subway Construction Company, the contractor for the railway tunnel, was at first favorable to the construction of these pipe galleries. On consideration, however, of the possible dangers to the subway in case of leaks, and the effect of a possible explosion of gas in the pipe galleries, the Construction Company expressed its disapproval of the proposed plan until it could be demonstrated that there would be no danger therefrom to the traveling public.

The Borough President, being satisfied that such dangers were not real, and having obtained authority to expend the necessary funds, proceeded to advertise for bills for the construction of those galleries. Upon the appearance of this advertisement, suit was begun by a taxpayer and an injunction obtained against the construction of the proposed galleries upon the ground that under the Charter the subject was within the jurisdiction of the Commissioner of Water Supply, Gas, and Electricity, and not of the Borough President. Such an injunction having been granted by the courts, the matter has been necessarily suspended.*

V.

LITIGATION.

Mandamus Proceedings as to the Payment for Ducts.—When the plans for the present subway were originally prepared, it was the expectation of the Chief Engineer that the necessary cables for conducting the electric power (if that form of power should be used) were to be suspended from the roof of the subway. Upon further study, after the construction of the subway had begun, it was thought more expedient that these cables should be carried in earthenware ducts to be imbedded in the walls of the subway and this mode of construction was thereupon adopted.

When the contractor sought to be paid for the expense of such construction, a question was raised as to whether this work was work of construction or of equipment under the terms of the Rapid Transit Act. That Act provided that "equipment to be supplied by the person, firm or corporation operating such road shall include all rolling stock, motors, boilers, engines,

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*The temporary injunction continued *pendente lite* by order of Mr. Justice Fitzgerald. See Dillon v. Cantor, reported in the N. Y. Law Journal, January 22, 1904.

wires, ways, conduits and mechanisms, machinery, tools, implements and devices of every nature whatsoever used for the generation or transmission of motive power."

The court at Special Term expressed the opinion that the ducts for carrying the electric cables were a part of the equipment as defined by the Act, and not an essential part of the structure. It was, therefore, decided that the expense of this device should be borne by the contractor and not by The City. On appeal to the Appellate Division this decision was reversed. The Court of Appeals ultimately sustained the view of the Appellate Division. The opinions rendered at Special Term by MR. JUSTICE O'GORMAN and by the Justices of the Appellate Division, are printed in the appendix. The Court of Appeals wrote no opinion.

Fowler Bi-Transit Patent Suit.—As stated in the report for 1902, the United States Circuit Court of Appeals, after the close of the year, affirmed the decision of the Circuit Court dismissing the bill on the ground of the invalidity of the patent. The opinion of the Circuit Court of Appeals is printed in the appendix.

Reilly Suit.—In this case an Inspector of Sewer Construction employed by the Board, having been discharged, applied for a writ of mandamus requiring the Board to reinstate him on the ground that he was entitled to notice of the charges against him, and an opportunity to explain. He denied that the reason given for his discharge, namely, a lack of work, was the true reason, and he alleged that this was a mere pretext. The Court at Special Term, in view of this conflict as to the facts, directed the issue of a peremptory mandamus and the trial of the question of fact before a jury. The complainant has not yet obtained the issue of the writ or taken any steps for bringing the case to a hearing. The opinion of MR. JUSTICE CLARKE at Special Term is printed in the appendix.

Barney Abutter Suit.—In this case, as stated in the report of the Board for 1902, Mr. Justice Leventritt denied an injunction upon the grounds of public safety and of the public interest. From this decision an appeal was taken to the Appellate Division, which affirmed the order of Mr. Justice Leventritt substantially for the reasons stated by him. The opinion of the Appellate Division is printed in the appendix.

CONDEMNATION PROCEEDINGS.

The following proceedings are now pending to acquire lands or easements for rapid transit purposes:

1. Proceeding to acquire easements of light, air and access on Broadway in the Borough of Manhattan between 122d street and 135th street.

2. Proceeding to acquire lands in the block bounded by Westchester, Brook and Bergen avenues and 149th street in the Borough of the Bronx.

3. Proceeding to acquire easements in lands at Fourth avenue between Eighth and Ninth streets in the Borough of Manhattan. This proceeding was begun to acquire easements for rapid transit purposes, and subsequently the Board of Aldermen, having authorized a change of the map or plan of the City and the widening of Fourth avenue at this point, a second proceeding was begun which was referred to the same Commissioners to acquire the surface for general City use.

4. Proceeding to acquire lands at the northeast corner of Worth and Elm streets in the City of New York for a station approach.

5. Proceedings to acquire subsurface rights along the line of the subway in Brooklyn. This proceeding is necessary in the Borough of Brooklyn because the City does not there own the fee of the streets, but only an easement for ordinary street use.

With the exception of the last mentioned proceeding, it is expected that reports will be obtained from the Commissioners in the year 1904. In every case, under the statute, title has already vested in the City, and the only question before the Commissioners is as to the compensation to be made.

During the year 1903 reports were made by Commissioners as to the amount to be paid for easements at the northeast corner of Forty-second street and Broadway, and the southeast corner of 103d street and Broadway.

Respectfully submitted,

THE BOARD OF THE RAPID TRANSIT RAILROAD COMMISSIONERS.

A. E. ORR, President.
BION L. BURROWS, Secretary.

APPENDIX I

RAPID TRANSIT COMMISSIONERS

AND

STAFF

RAPID TRANSIT COMMISSIONERS

NAME	DATE OF ELECTION OR APPOINTMENT	REMARKS
Alexander E. Orr,	Appointed by Act of May 22, 1894.	Resigned June 8, 1894.
	President N. Y. Chamber of Commerce, June 8, 1894.	Term of office expired May 5, 1899.
	Elected President of the Board, June 8, 1894.	
	Elected member of the Board May 11, 1899.	
	Re-elected President May 23, 1899.	Now in office.
John H. Starin,	Appointed by Act of May 22, 1894.	
	Elected Vice-President, May 28, 1895.	Now in office.
William Steinway,	Appointed by Act of May 22, 1894.	Died Nov. 30, 1896.
Seth Low,	Appointed by Act of May 22, 1894.	Resigned June 11, 1896.
	Mayor, Jan. 1, 1902.	Term of office expired Dec. 31, 1903.
John Claflin,	Appointed by Act of May 22, 1894.	
	Elected Treasurer May 28, 1895.	Resigned May 11, 1899.
	Re-elected Member of Board, Dec. 27, 1901.	Now in office.

RAPID TRANSIT COMMISSIONERS—*Continued*

NAME	DATE OF ELECTION OR APPOINTMENT	REMARKS
Thomas F. Gilroy,	Mayor, June 8, 1894.	Term of office expired Dec. 31, 1894.
Ashbel P. Fitch,	Comptroller, June 8, 1894.	Term of office expired Dec. 31, 1897.
John H. Inman,	Elected June 8, 1894.	Died Nov. 5, 1896.
William L. Strong,	Mayor, Jan. 1, 1896.	Term of office expired Dec. 31, 1897.
Woodbury Langdon,	Elected November 19, 1896.	Now in office.
George L. Rives,	Elected November 19, 1896.	Resigned Dec. 27, 1901.
Charles Stewart Smith,	Elected Dec. 10, 1896.	Now in office.
Robert A. Van-Wyck,	Mayor, Jan. 1, 1898.	Term of office expired Dec. 31, 1901.
Bird S. Coler,	Comptroller, Jan. 1, 1898.	Term of office expired Dec. 31, 1901.
Morris K. Jesup,	President N. Y. Chamber of Commerce, May 5, 1899.	Now in office.
Edward M. Grout	Comptroller, Jan. 1, 1902.	Now in office.
George B. McClellan,	Mayor, Jan. 1, 1904.	Now in office.

STAFF OF THE COMMISSION

NAME	DATE OF ELECTION	REMARKS
Wm. Barclay Parsons,	Chief Engineer, June 18, 1894.	
Henry R. Beekman,	Counsel, June 18, 1894.	Resigned Jan. 1, 1895.
Albert B. Boardman,	Counsel, June 18, 1894.	
Parsons, Shepard & Ogden,	Counsel, Jan. 1, 1895.	Firm dissolved Jan. 1, 1902.
Tracy, Boardman & Platt (now Boardman, Platt & Soley),	Counsel, Jan. 1, 1895.	
Edward M. Shepard,	Counsel, Oct, 1, 1902.	Succeeding Parsons, Shepard & Ogden.
Lewis L. Delafield,	Secretary, June 18, 1894.	Resigned June 1, 1899.
Bion L. Burrows,	Secretary June 1, 1899.	
H. A. D. Hollman,	Auditor, May 10. 1900.	
James Dolan,	Messenger, June 28, 1894.	

APPENDIX II

OPINIONS OF THE COURTS

SUPREME COURT.

COUNTY OF NEW YORK.

In the matter, etc., of JOHN B. McDONALD, *Petitioner.*	Special Term.

GEORGE W. WICKERSHAM, for the Petitioner.

GEORGE L. RIVES, for Edward M. Grout, Comptroller, respondent.

O'GORMAN, J.—This is an application for a writ of mandamus requiring the Comptroller of The City of New York to pay a voucher for $400,000, issued by the Rapid Transit Commission to the contractor for extra work for placing ducts in the tunnel.

Under the contract for the construction of the underground rapid transit railway the City is to bear the cost of construction and the contractor is to take a lease of the road at a stipulated rental and bear the cost of its equipment and maintenance. The contract provides that the motive power shall be electricity or compressed air, which shall be so used as to involve no combustion in the tunnels or any injury to the purity of the air in the tunnels. It further provides that the Contractor's plans and methods of equipment are subject to the approval of the Board of

Rapid Transit Commissioners. In compliance with this latter provision, the Contractor proposed to the Rapid Transit Commissioners that electricty, and not compressed air, be adopted as the motive power, that the power be delivered to the trains through a third rail or equivalent conductor, "and that the current should be carried in conduits placed in suitable chambers in the side walls of the subway." The Board approved this plan by the following resolution: "Resolved, That the adoption by John B. McDonald, Contractor, of electricity for the motive power for the rapid transit railroad in the boroughs of Manhattan and The Bronx, now under construction, be and the same hereby is approved; that the conduits for such electricity may be placed in ducts in the side walls of the tunnel, subject, however, to the approval of the plans therefor by the Chief Engineer; and that the electrical conduits may be installed in such ducts, but subject to plans to be approved by the Chief Engineer; but provided, however, that the cost of such conduits and installation be borne by the contractor as part of the cost of construction under the contract between him and the City." The contractor protested against the final part of this resolution, and renewed his request previously made that the "additional cost made necessary by the construction of the vitrified ducts, or conduits, in the tunnel walls, and the expense of additional excavation required by such change" should be paid for as extra work. Thereafter the Board, by a majority vote, determined that the additional portion of the tunnel constructed for electrical cables and including the mason work chambers in which the cables are laid is part of the road and not part of the equipment, and should be regarded as extra work in the construction.

This action of the Rapid Transit Commissioners cannot be upheld. While acting within the authority delegated to them their action will not be interfered with, but where it is claimed they have gone beyond the scope of their authority their conduct will be reviewed by the courts. Concededly under the statute the Commissioners have no right or power to designate as work of construction what the Legislature has declared to be equipment. The counsel for the petitioner upon the argument admitted that in a plain case the aid of the court might be invoked by the aggrieved party; but it must be obvious that the simplicity or complexity of the case cannot affect the legal rights of the parties.

In the Matter of the Rapid Transit Commissioners, 5 App. Div., 290, the Appellate Division, speaking of another provision of the statute, said: "The Rapid Transit Commissioners have no power to fetter the action of the courts. They have no right to deprive the contractor of this provision of the law by any restrictions in the contract," and, it may be added, they have no power to deprive the City of its rights under the statute.

Under the act creating the Commission the word "equipment" is given a much broader significance than it usually receives. It includes not only motors and cars, but also, among other things, all power houses, real estate upon which power houses shall rest, wires, ways, conduits, mechanisms, implements and devices of every nature whatsoever used for the transmission of motive power, whether such equipment be situate on or near or separate from the railway. It is clearly the duty of the contractor to supply at his own cost the rolling stock and all means of propulsion. These ducts or tubes, placed by the Contractor in the side walls of the tunnel, are no necessary part of the permament structure. They are avowedly to be used for the sole purpose of transmitting power. The mere permission given by the Board to the Contractor to locate the tubes in the side walls of the subway is not sufficient to make the work in question work of construction. The Board might have refused its permission. It might have required the contractor to locate the tubes at the top of the tunnel, between the exterior upper surface and the bed of the street, or in a trench removed to one side of the tunnel, or in other streets parallel to the streets through which the railroad will run, with occasional spurs to the line of the railroad. If these tubes as now being laid and the increased excavation will cost upwards of $1,200,000, as claimed by the petitioner, the cost would probably be much greater if one of the other methods were adopted, and certainly in none of these cases could the tubes or the necessary excavation be regarded as a part of the construction.

The fact that for the convenience of the Contractor and the better operation of the road, he was allowed to insert the tubes in the walls of the tunnel does not make the tubes any the less a part of the equipment as defined by the act. They are an incident of the equipment, and nothing more. It will not be contended that they are an essential part of the structure. If not needed as a means of propulsion they serve no purpose whatever. They are simply a way, conduit or device for transmitting power, and, being part of the equipment, the Rapid Transit Commissioners had no power to treat any part of the work as construction or to award the Contractor extra compensation therefor.

The claim that the equipment intended by the statute is something in the nature of machinery or mechanism or something otherwise separable from the structure is unfounded. The tubes which will convey the electricity from the power house on the Hudson River, through the public streets to the line of the railroad, are equipment, but will be connected in a very permanent fashion with the railroad itself. While it may have been contemplated that a part of the equipment would be separable from the road, there is nothing in the language of the act which in express terms or by necessary implication indicates that all the equipment must be separable. Indeed, the act expressly speaks of the equipment being "on or near or separate" from the road.

The rules as to fixtures invoked by the petitioner have no application. This controversy turns upon the enlarged significance to be given to the word equipment as defined by the statute, and it seems to be quite clear that while the City was to pay for and become the owner of the permanent structure, which was always to be available for the carriage of passengers and property, the Legislature intended that the contractor should take every risk and bear every expense connected with the motive power and the means of operation. The lease to the Contractor is to run for fifty years, and if during that period new means of propulsion or new methods of applying old forms should render these tubes or ducts useless, the loss should fall upon the Contractor and not upon the City.

Application for a mandamus denied:

(*Reported,* 39 *Misc.* 18.)

SUPREME COURT.

APPELLATE DIVISION.

In the matter, etc.,

of

JOHN B. McDONALD,

Appellant.

This application was for a mandamus to require the Comptroller of The City of New York to draw and issue a warrant on the Chamberlain of the said City for the sum of $400,000 as a payment on account of certain construction work on the Rapid Transit Railroad of The City of New York. There is no substantial dispute as to the facts.

It appears that on the 21st of February, 1900, the relator entered into a contract with The City of New York, acting by its Board of Rapid Transit Railroad Commissioners, for the construction and operation of a rapid transit railroad in the boroughs of Manhattan and The Bronx, in The City of New York, pursuant to the provisions of chapter 4 of the Laws of 1891, as amended by chapters 102 and 556 of the Laws of 1892; chapters 528 and 752 of the Laws of 1894; chapter 519 of the Laws of 1895; chapter 729 of the Laws of 1896, and by chapters 7 and 616 of the Laws of 1900; that after the execution of this contract the relator entered upon the work under the contract which is now in progress; that the contract contained no provision for the construction of any ducts, ways or conduits through which might pass the electric wires to be used for transmitting motive power in case electricity was chosen as such power, but provided that "the motive power for the railroad shall be electricity or compressed air, which shall be so used as to involve no combustion in the tunnels or any injury to the purity of the air in the tunnel;" thus leaving the question as to the motive power to be used in the operation of the road to be subsequently determined by the Commissioners under the power conferred upon them by the statutes before referred to; that it was contemplated at the time of the execution of the contract, if electricity was adopted as to the motive power to be used, that the wires for transmitting the current of electricity should be strung within the tunnel itself; that the relator went on with the construction of the tunnel. The plans upon which the original contract was made show solid walls on the sides of the tunnel of a specified thickness.

On the 27th day of November, 1900, the relator submitted to the Board a communication, calling their attention to the fact that the motive power to be employed in the operation of the road had not been definitely determined; that at present compressed air was out of the question as a motive power; that the only practicable method to be considered was electricity, and asking the Board to consider the general question whether or not electricity should be adopted as the motive power to be employed in the operation of the railroad. It was also stated that in the opinion of the best experts the electrical power should be delivered to the trains in the form of direct or continuous current through a third rail or equivalent conductor, and that the current should be carried in conduits placed in suitable chambers in the sidewalls of the subway; that if the Board should approve of this suggestion, it would be necessary to authorize the construction of a sufficient number of passageways or chambers in the sidewalls of the subway to accommodate the electrical ducts or conduits which would be required; and plans were submitted to the Board, showing the proposed construction, by which there was to be constructed in the walls of the tunnel vitrified brick or tile chambers, through which the electrical ducts or conduits were to run; that this plan would require a greater excavation than is provided for in the plans of the railroad by a space of about eight inches on each side of the subway as planned, besides manholes about ten feet long and six feet in width, at intervals averaging about 400 feet; that this change in the plan of construction of the tunnel walls, as well as the additional excavation made necessary by the adoption of a motive power not determined in the contract, and not foreseen when it was prepared, should be regarded by the Board as extra work of construction in addition to that called for by the contract; that the conduits or ducts which were to be placed in the chambers referred to would not be a part of the equipment which the relator was under obligation to furnish, but that the change in the construction of the tunnel wall and the additional excavation made necessary by widening the tunnel to fit it to carry the electrical equipment were to be fairly regarded as additional work to that provided for in the contract and to be the subject of extra compensation. This letter was received by the Board and referred to its Counsel and Chief Engineer for report. Plans for the additional work necessary to include the said ducts in the walls of the tunnel were submitted by the relator to the Chief Engineer of the Board and approved by him, and thereupon the relator proceeded to construct said walls as provided for by the modified plan.

Nothing further seems to have been done by the Board until the 27th day of September, 1901, when the Chief Engineer submittd a report approving of the suggestion of the relator that electricity was the most approved form of power, and that by it the road could be operated in the most satisfactory manner, it being stated that it would be impossible to determine at that time how many of the ducts or chambers were required for the construction of the road, that allowance should be made for reasonable extensions, and that as soon as the relator finally adopted the site for the power house and worked out his schemes for electrical distribution, it would be possible to determine the number of ducts that would be required; and in the meantime, in order that the work should not be delayed, he had permitted the Contractor to build at his own expense ducts in the walls of the subway. On June 12, 1902, at a meeting of the Board, when this subject was brought up for discussion, the Chief Engineer was asked whether the construction of these ducts was a part of the construction, whereupon a resolution was passed by the Board—the Mayor and Comptroller voting in the negative—that it was the sense of the Board that so many of these ducts as were necessary for the operation of the Rapid Transit Railroad were a part of the said railroad and not a part of the equipment. At the same meeting it appears that the question as to whether the construction of these ducts was a part of the road or of the equipment was referred to the Counsel of the Board, who reported that in their view the extra expense caused to the Contractor by the construction of the walls and the excavation therefor was construction for which the Contractor was entitled to be paid by The City of New York; and the Board, at a meeting held on the 25th day of June, 1902, resolved that the additional materials furnished or to be furnished for the purpose of supplying and building the ducts above referred to should be regarded as additional work and materials under the terms of the contract, and should be done and paid for as extra work under the contract for construction and operation, and that the cost thereof should be deemed a part of the costs of the Rapid Transit Railway and paid to the Contractor as such, and that the Chief Engineer was directed to have a voucher prepared for transmission to the Comptroller for the reasonable value of such additional work and materials up to the 1st day of June, 1902. It also appeared that, in pursuance of that resolution, a requisition for such additional work, asking for the sum of $400,000, was prepared by the relator, duly certified to by the Chief Engineer, and approved by the Board, who directed that a voucher be drawn on the Comptroller for the amount, which voucher was duly certified to by the Auditor and by the President of the Board of Rapid Transit Commissioners, and presented to the Comptroller, who refused to pay the same upon the ground that the amount called for was for the construction of ducts, a part of equipment of the Rapid Transit Railroad, and did not constitute extra or additional work to be paid for by the contractor in addition to the price provided for by the contract.

The question presented is whether this voucher, under the statutes and the contract between the Rapid Transit Railroad Commissioners and the relator, is for construction or equipment. The statute under which this work is done (chapter 4 of the Laws of 1891, as amended as hereinbefore indicated), requires the Board of Rapid Transit Commissioners to determine whether the rapid transit railroad should be constructed (section 4, as amended by Laws of 1895, chapter 519, and Laws of 1900, chapter 616); that in the event of a determination to construct such road the Rapid Transit Commissioners shall proceed to prepare detailed plans and specifications for the construction of such rapid transit railway in accordance with the general plan of construction, and from time to time alter such detailed plans and specifications, but always so that the same shall accord with the general plans of construction (section 6, as amended by Laws of 1896, chapter 729). Section 34 of the act provided that in case the people of The City of New York should determine by vote, as provided for by sections 12 and 13 of chapter 752 of the Laws of 1894, that any such raidway or railways should be constructed at the expense of such city, then it should be the duty of the said Board to proceed with the construction of such railway or railways and provide for the operation of the same; that as soon as the necessary consents had been obtained the said Board for and on behalf of said City should enter into a contract with any person, firm or corporation, which, in the opinion of said Board, should be best qualified to fulfill and carry out said contract for the construction of such road or roads upon the routes and in accordance with the plans and specifications so adopted, for such sum or sums of money, to be raised and paid out of the treasury of the City as in the act provided, and on such terms and conditions, not inconsistent with the plans and specifications, as said Board should determine best for the public interest; that such contract should also provide that the person, firm or corporation so contracting to construct such road or roads should, at his or its own cost and expense, equip, maintain and operate said road or roads for a term of years to be specified in the contract; that such contract should further provide that the person, firm or corporation so contracting to construct, maintain and operate said road shall annually pay into the treasury of said City, as rental for the use of said road, a sum which should not, except as in the act provided, be less than the annual interest upon the bonds to be issued by said City for the construction of said road, and in addition to said interest a further sum which should be equal to a percentage of not less than one per centum upon the whole amount of said bonds. It was further provided that such contract should contain provisions for the valuation of the whole or a part of the property of the said contracting person, firm or corporation, employed in and about the equipment, maintenance and operation of said road, and for the purchase of the same by the City at such valuation, or a percentage of the same, should said lease not be renewed; and that the City in and for which said road shall be constructed should also have a first lien upon the rolling stock and other property of the said contracting person, firm or corporation constituting the equipment of said road, and used or intended for use in the maintenance and operation of the same, as further security for the faithful performance by such contracting person, firm or corporation of the covenants, conditions and agreements of said contract. Section 35 of the act provides: "The equipment to be supplied by the person, firm or corporation operating such road shall include all rolling stock, motors, boilers, engines, wires, ways, conduits and mechanisms, machinery, tools, implements and devices of every nature whatsoever used for the generation or transmission of motive power, and including all power houses and all apparatus and all devices for signaling and ventilation." Section 38 provides that the Board of Rapid Transit Commissioners may, from time to time, with the consent in writing of the bondsmen or sureties of the person, firm or corporation which has contracted to construct, equip, maintain and operate said road or roads, or any of them, agree with said contracting person, firm or corporation upon changes in and modifications of said contract, or of the plans and specifications upon which said road or roads is or are to be constructed.

In pursuance of the provisions of this act, a contract for the construction of the Rapid Transit Railroad was made between the Rapid Transit Commissioners and the relator, by which the relator agreed to fully contract and equip the Rapid Transit Railroad upon the general plans mentioned, and thereafter to use, maintain and operate the same under a lease thereof from the City for a period of fifty years. Section 8 of the first chapter of this contract provides: "The word 'equipment' to mean all equipment used or intended for use on the railroad, including all motor cars, whether used for passengers, freight, express, or any other purpose, and all other rolling stock, all boilers, engines, wires, ways, conduits, mechanism, machinery, power-houses, all real estate upon which any such power-houses shall stand or which shall be necessary for the generation or transmission of motive power, and all tools, implements and devices of every nature whatsoever used for such generation or transmission of motive power, and also all apparatus and devices for lighting, signaling and ventilation, whether such equipment be situate on or near or separate from the railway, provided that the same be used or intended for use in connection therewith or for any of its purposes, and including all such equipment in existence at any time during or at the end of the term of the lease." Section 13 of the chapter provides: "The word 'construction' to mean all the work of constructing the railroad, including the doing of work, the providing of materials, the complete furnishing of the equipment of the railroad, the restoration and reconstruction of street surfaces, sewers and other sub-surface structures, and all other work or materials to be done or furnished of every nature whatsoever under the agreement for construction." Chapter 2 of the contract provides for the construction of the road by the relator. He there agrees, at his own cost and expense, and in strict conformity with the specifications, to furnish all the materials and labor necessary and proper for the purpose, and, in good, substantial and workmanlike manner, construct the railroad; and also to provide a complete equipment of the railroad according to definition of equipment and according to the specifications; and the City is to pay and the contractor to receive for the construction of the railroad the sums specified in the contract. The contract also provides that the Board shall have the right, on any section of the railroad, to require additional work to be done or additional materials to be furnished, or both, within the general purview of a rapid transit railroad as described in the copy of the routes and general plan. If such additional work or materials should be required, then the reasonable value thereof should be paid to the contractor. It is also provided that the work to be done and the materials furnished are to be subject to the direction and approval of the engineer. The contractor shall promptly obey and follow every direction within the general purview of the work which shall be given by the engineer, "or if any other dispute, question or doubt as to what is the obligation of the contractor shall arise prior to the time of the complete construction and equipment of the railroad and the declaration thereof by the Board, the determination of the engineer shall be binding upon the contractor and the City so far as that the contractor shall, as the case may be, proceed or refrain from proceeding, and without any delay obey the requirement of the engineer. But a determination of the engineer shall not be finally conclusive upon either the contractor or the City * * * as to the question whether the contractor is entitled to additional payment for anything additionally required by the engineer. * * * In every such case the engineer shall make his determination in writing and in duplicate, one duplicate to be filed with the Board and the other duplicate to be delivered to the contractor. Such determination as to work done or materials supplied on or after the first day of the calendar month next preceding the date of making such certificate, shall, if filed with the Board within five days after its said date, be binding and conclusive upon the City unless the Board shall appeal within ten (10) days after such determination is filed with it, and shall appeal within ten (10) days after such delivery to him. * * * The contractor shall become entitled to additional payment for additional work or by reason of additional specifications, drawings, details or other requirements only upon the production of the certificate and determination of the engineer if unappealed from and certified by the Board, or, if so appealed from, then only upon and according to the final award of arbitrator or umpire as aforesaid certified by the Board." It is further provided that "The City shall pay the Contractor for the work as the same progresses upon vouchers certified by the Board;" that the amount so certified by the Board shall be forthwith paid by the City to the Contractor without any deduction, and that "full and sufficient equipment, including all rolling stock, * * * subways, conduits, mechanisms, * * * implements and devices of every nature whatsoever used for the generation or transmission of motive power, and including all power-houses, real estate necessary therfor, or for the generation or transmission of motive power, and all apparatus for signaling and ventilation, are to be provided by the contractor at its expense, as provided in the statute."

GEORGE W. WICKERSHAM for the appellant.

GEORGE L. RIVES for the respondent.

HATCH, J.—*(After stating the facts, as above).* It cannot, I think, be doubted but that both statute and contract contemplated that the Commissioners should exercise very broad powers in providing for the construction of the tunnel and in changing the detail of the plans after the same had been begun. In the exercise of power respecting changes the only limitation seems to be that departure should not be made from the general plan of construction. It logically follows, therefore, that whenever the Commissioners, by reason of matters not contemplated when the contract was made, and the exigency of the situation required a change in method and manner of construction, they have the power to make such change, and the Contractor is bound to observe and comply with the directions given concerning it. As motive power was in process of development when the contract was made, it was not definitely determined what power should be used; when this subject was settled it was agreed that electricity was the only power practicable. The Commissioners, when this conclusion was reached, undoubtedly had the power to make such change as was necessary to conform the tunnel to meet the requirements of electricity as a motive power and enlarge the same in order to make provision therefor. Consequently, the increased excavation which was found necessary for the walls of the tunnel in order to accommodate and apply the electric motive power to the best advantage was clearly within the power of the Commissioners to direct, and the work rendered necessary thereby became a part of the construction of the tunnel. Primarily, the construction of the tunnel was to furnish a place for a railroad. The whole purpose is to enable a railroad to be operated in this space, and when the space is excavated, it becomes a place in which to put the equipment of a railroad; and this embraces cars, rails, motive power and all else essential to the complete establishment of the same with the power of the Commissioners to order the Contractor to do, increased excavation, therefore, rendered necessary by the adoption of electricity as a motive power, was clearly within the power of the Commissioners to order the Contractor to do, and when done, it was properly chargeable to construction.

The vitrified ducts, which form a part of the solid wall of the tunnel, fell within the same category, and if the enlargement of the excavation be construction, the wall is also. I am quite ready to concede that within a strict definition and in a technical sense, these ducts, or hollow vitrified brick, may be described as a conduit or way, and therefore within the words of the statute; but that is not the controlling consideration. The tunnel is that, and it is properly described as a conduit, or way, for the passage of cars, but because the cars run through it does not make it equipment. The real question is what are these vitrified ducts, within the meaning of the statute and the contract thereunder? It is evident that the statute and the contract provide for two separate things, each one quite independent of the other in fact and in all the essential rights of property. The evident intention is to keep the two perfectly divisible. That part of the tunnel which is construction, the City is to furnish, pay for and own. That part which is equipment, the Contractor is to furnish, pay for and own, subject, when provided, to a certain lien on the part of the City for its protection. The entire tunnel proper is regarded as a street, of which the City is the owner in fee. The Contractor cannot own any part of this structure, or have an interest therein, except to place therein a railroad, with the necessary power to operate it. His interest must, of necessity, be a severable, personal property interest in the equipment, which, if not paid for by the City at the expiration of the term of the lease, he may remove as his property. The language of the statute as to what constitutes equipment provides that it "shall include all rolling stock, motor, boilers, engines, wires, ways, conduits and mechanisms, machinery, tools, implements and devices of every nature whatsoever used for the generation or transmission of motive power, and including all power-houses and all apparatus and all devices for signaling and ventilation" (Laws of 1891, chap. 4, § 35, as amended by Laws of 1896, chap. 729, and Laws of 1900, chap. 616); thus showing that the statute contemplated by this recital that the equipment in its essential characteristics should be personal property. So far as it speaks of real property, it is of such property as is independent of the tunnel, use of which is made for the generation and transmission of motive power to the tunnel proper. The property, used for the generation of power to be supplied to the tunnel, would not have been embraced within the term equipment had not the statute so named it. It is essentially real property, necessary for the operation of the railroad; and as it was essential in order to furnish motive power, the duty was devolved upon the Contractor to furnish it, and upon that the City was given a lien as well as upon the equipment used in the tunnel. The title to this property, whether real or personal, is in the Contractor, and upon it the City is given a lien. It is incomprehensible that the City can have a fee in real property and another person own a part of it at the same time. Either the City's property right in the tunnel is less than a fee, and the Contractor has a property right therein, or else that which forms an integral part of the tunnel is owned by the City, and, if so, must necessarily be a part of the construction. It must be conceded, I think, that the Commissioners had the power in the original plan to construct the side walls of the tunnel entirely of hollow, vitrified brick, whether thereafter used as a receptacle for the conduits proper or not. If such had been the plan, it could not be contended but that the wall itself, even though constructed of hollow brick, would be a part of the construction. It could have constructed the walls of the tunnel of solid brick, leaving holes therein, through which the conduits transmitting the power could be placed, and no one would then contend but that the wall was construction, even though used by the contractor as a place for his conduit. What the Commissioners could do in the beginning, they could do during the progress of the work with the same force and effect as though it was originally planned. What they did was to change the plan by providing for the enlarged excavation. There was then constructed a wall next the side of the excavation made of hollow brick coated with water-proofing. Next this structure were placed the vitrified ducts, inclosed in mortar. On the outside of this and forming the inner wall of the tunnel, has been placed a mass of solid concrete, thirteen inches thick, the whole inclosed at top and bottom in a solid mass of concrete and mortar. As the wall reaches the stations constructed along the line, the vitrified brick ducts are carried under the floors of the stations and covered over with about three inches of concrete, over which is placed a tessellated floor; and leaving the station, the vitrified brick ducts again enter the continuing wall. This whole construction is as firm and solid a part of the structure as are the steel supporting columns—is as much an integral part of the whole as is the roof, which spans the top.

Upon what principle of law can it be held that the Contractor owns under the terms of this contract a part of this structure, and how, if vested with such ownership can the City have a fee therein? The conduit which conveys the motive power to run the railroad consists of lead tubes, lined with copper, in which run the electric wires; and the actual conductor of the power is drawn through the ducts from the manholes. Because the vitrified brick chambers are used as receptacles for this conduit, does not make it a part of the equipment any more than does the open space of the tunnel make it equipment because the cars run therein; and the ducts do not become any less a part of the solid wall because they are used for holding the conduits which carry the live electric wires. As we have before observed, the contract itself contemplated a severable interest of property rights, distinct and independent. No construction of it ought, therefore, to obtain which makes such rights joint, instead of several, and which gives a part ownership in the fee of the tunnel, when the statute vests it absolutely in the City. It is to be borne in mind that at the expiration of the lease the City is to take and pay for the equipment, and intermediate that time it has a lien thereon. It must follow that if the City for any reason refuses to take and pay for the equipment upon the termination of the lease, the contractor will have the right to remove the same. He has title to the property and is either entitled to be paid for the same, or have the right to take possession. This is his legal right, if he has title thereto. The City upon its part is authorized to enforce its lien against the property of the Contractor and is invested with all legal remedies in enforcement of the same, in the event that the Contractor is guilty of a breach of the contract. Suppose the City forecloses its lien and sells the vitrified brick, which has become an integral part of the wall, what would it deliver to the purchaser, and how would the latter get possession of the property thus sold? A judgment of foreclosure would not provide for a destruction of the wall of the tunnel, as it would not be the appropriate relief in such an action, and a purchaser could take nothing unless he acquired the right to destroy a portion of the wall. Certainly neither the statute nor the contract contemplated such a result. The presence of the vitrified brick does not make the structure any less a wall nor change its permanent character, nor is it more or less a way or conduit than the place where the rails are laid and the cars operated. By the provisions of the contract the contractor is not to furnish equipment until after two-thirds of the work of construction is done. This clearly contemplates that the tunnel should be excavated and the walls finished before the Contractor should begin to supply equipment, and the same thing is true as to the schedules of equipment, which he is required to file. Clearly, therefore, the contract contemplates that equipment was considered as something entirely aside from and independent of the permanent structure constituting the tunnel proper. Such provision is inconsistent with the idea of ownership of any part of the permanent structure of the tunnel. The metal tubes which carry the electric wires answer completely the statutory definition of equipment and the terms of the contract. This is introduced after the structure is completed and may be removed therefrom without damage to the structure or interferance with its integrity. It is property to which a lien can attach, and upon which it may be enforced. There is no inconsistency of title as to it, even though it passes through the walls of the tunnel. Such view harmonizes the provisions of the statute and contract as to what is essentially construction and what is essentially equipment. I am not able to see that any other view does, so far as this matter is concerned. Equipment in this respect can be introduced after the tunnel is completed. The vitrified brick cannot be so introduced; when it is introduced it becomes a part of the permanent structure.

It seems to me, therefore, that as the Commissioners could have originally authorized the enlarged excavation and this method of constructing the wall for the purpose for which it is to be used, they possessed the same power after determination was made to use electricity as the motive power, and they had then the same reserved power to direct the construction of both tunnel and wall in this manner as they had in the beginning. When the Commissioners so determined the Contractor had no alternative but to obey and construct the tunnel and its walls in that particular manner. The engineer in charge of the work, and every one in authority, have placed this construction upon the statute and the contract, and determined what is the physical fact, that this vitrified brick was an integral, inseparable part of the wall. Being such, the City has the absolute title to the whole structure, and it seems to me absurd to say that the Contractor can have any ownership therein or the City any lien thereon. If this view obtains, it necessarily follows that the Contractor became entitled to be paid for the items for which the warrant was directed to be drawn. There are some small items of steel, expanded metal and cast iron, which the record does not make clear whether they are a part of the structure. I do not understand, however, that there is any dispute but that the Contractor is entitled to be allowed those items, as forming a part of the construction if our view obtains as to what constitutes equipment and what construction. If otherwise, as to these items an alternative writ would be necessary.

If these views are sound, it follows that the order should be reversed with ten dollars costs and disbursements, and the writ directed to issue with fifty dollars costs.

VAN BRUNT, P. J., and McLAUGHLIN, J., concur.

INGRAHAM, J.—I concur in the conclusion of MR. JUSTICE HATCH. The scheme adopted by the statute imposed upon the Board of Rapid Transit Commissioners extensive power in the construction of this road. They were to provide the plans by which the road was to be constructed, and necessarily were to determine the width of the cut, the thickness of the walls and just how they were to be constructed, and from time to time as the construction proceeded they had authority to change the plans or the method of construction. The construction of the subway was to be paid for by the City; the equipment of the road was to be paid for by the Contractor, and the statute defined what should be equipment and what should be construction. The contract that was made carried this definition of equipment into it. It cannot be doubted but that the Board and the Engineer had power to change the plans for the side walls of the tunnel and provide that they should be thicker than provided for by the original plans and contain open spaces to be used for the conduit, by which the electric power was to be carried to the cars to be used in operating the road. I quite agree with the Court below that neither the Board nor the Engineer could call that construction which was in reality equipment, and compel the City to pay for it; but the Board had the right to determine how the side walls of the tunnel should be constructed and that it should contain spaces to be used for the ducts or conduits for the electric wires, and such a provision would not make the whole wall a duct or conduit, nor the cost of constructing the walls cost of equipment. When the Rapid Transit Commissioners determined that the walls should be built wider than at first contemplated, and in that wall there should be left a space to be used for a conduit, it determined the question of the construction of the wall which was an essential part of the subway construction. I think we should look at this wall as if its present method of construction had been provided for by the original plans, as undoubtedly it would have been if at the time the original plans were made it had been determined that electricity should be used as the motive power, and that the safe and efficient operation of the road required that the ducts for the transmission of this power should be inserted in the wall; and in that case, I do not think it would have been claimed that the cost of the construction of the wall should be charged to equipment. The fact that the determinaion by the Board to adopt electricity as the motive power, and that the proper method of supplying such electricity to the cars was by ducts or conduits built into the wall could not upon any principle make the cost of the necessary excavation or the building of the wall a part of the equipment, any more than if the Board had originally determined to build the wall as it is now built. It is still the wall of the subway, which is a part of the construction of the road itself; and the cost of building that wall seems to me to be clearly a cost of the subway itself, and not equipment. The cars to be used in the operation of this road are clearly equipment to be furnished by the Contractor. If, after the plans had been prepared, it had been determined to run cars considerably higher than originally contemplated, and in consequence of that change in the height of the cars it had been necessary to increase the height of the subway, I think that the cost of building the increased height could not be called equipment, although such increased height was made necessary by the equipment to be furnished by the Contractor, and so the fact that the adoption of electricity required that the walls should be thicker so as to contain the ducts or conduits through which the electric wires were to run would not make the walls themselves conduits or the increased cost of building the walls the cost of equipment.

The modified plans, as adopted, provided that there should be inserted in the walls a vitrified brick chamber or duct through which the wires should be placed which carried the electricity from the outside of the tunnel to the cars. The photographs and plans, a part of the record, show clearly this method of construction. I was inclined to think that these vitrified brick conduits or ducts would come within the definition of equipment which is contained in the statute. They are to be used to carry the electric wires and thus be "ways, conduits and mechanisms, * * * used for the transmission of motive power," and as such equipment under section 35 of the Act. There is, I think, a distinction between the wall of the subway and these ducts or conduits inserted in the wall. One is essentially a necessary part of the subway. The other is essentially a part of the equipment, and whether these ducts were placed inside the wall or outside the wall, they had no relation to the construction of the road itself, but were there solely for the purpose of furnishing a method for the transmission of the elecric power. The statute provides that "wires," ways, conduits and mechanisms * * * and devices of every nature whatsoever used for the * * * transmission of motive power" shall be equipment.

As, however, the Corporation Counsel conceded on the argument that this was all construction or all equipment, and as I am clearly of the opinion that the walls are construction and not equipment, I concur in granting the application.

LAUGHLIN, J.—I agree with MR. JUSTICE HATCH that the relator is entitled to recover of the City the cost of the extra excavation necessitated by the change of plans incident to placing the conduits for the electrical cables in the side walls of the tunnel and of constructing the vitrified hollow tile conduits or ducts.

During the argument it occurred to me, but the point was not made by counsel for the respondent, that it would be inequitable to decide that this extra work was construction, the entire cost of which must be borne by the City, for the reason that if the Contractor is to be permitted to use these conduits without paying rental to the City, other than the low rate of rental provided for on all construction originally contemplated to be made by the City and on which his competitors in bidding figured, he is saved a tremendous outlay of money, it having been his duty under the statute and contract, before the alteration thereof, to construct all conduits that might be necessary for carrying the electrical cables, as part of the equipment and at his own cost and expense. It would seem that this question should have been considered by the Board of Rapid Transit Railroad Commissioners before consenting to a change of the plans, or rather before consenting to a change thereof upon the understanding that the contractor was to be permitted to use the conduits constructed in the side walls free of special rental or other charges. Of course, if the Commissioners deemed the construction of these conduits in the side walls sufficiently beneficial and advantageous to the City to justify them in paying the entire expense thereof even if the Contractor refused to pay a rental therefor, they not only had the power but I think they might properly have consented to the construction at the expense of the City; but it does not appear that they endeavored to obtain from the relator an agreement to pay the fair value of the use and occupation. However this may be, the propriety of the action of the Commissioners is not presented for review. The learned Corporation Counsel expressly stated on the argument that the respondent does not contend that the payment of this claim may be resisted upon equitable grounds, but concedes the contrary; and bases his action solely upon *want of power* on the part of the Commissioners to change the plans and contract and require this additional excavation and the construction of these conduits at the expense of the City. It is thus conceded that there is no reason for withholding the writ on discretionary grounds; that all facts relating to the right of the relator to payment for this work are fully presented by the moving papers and raise a question of law pure and simple, depending solely on the *power of the Commissioners;* and that no question concerning the improper exercise of such power is involved. Nor is it claimed that the Comptroller in refusing to honor the voucher exercised any judicial, discretionary or other than ministerial power, or that the relator should be left to an action at law. By stating these concessions on the part of the Corporation Counsel, I am not to be understood as disagreeing with him. They are merely stated for the purpose of showing that the questions which would otherwise require consideration and an expression of opinion by the Court have not been investigated by me and I express no opinion thereon. The single problem thus presented on the appeal is not difficult of solution.

That this method of construction is superior and will tend to insure greater safety to passengers and those working in the tunnel as well is manifest. Had the idea been thought of or suggested originally there can be but little doubt that it would have been adopted then. We cannot say that the change of plan was made solely for the benefit of the Contractor. I think the fair inference is that it is for the benefit of the City and of the public as well. It does not appear how long this tunnel will last, but the fair inference is that it will last much longer than the period of fifty years over which the lease to the Contractor extends, and probably, by repairs and reconstruction from time to time, it will last indefinitely. Moreover, express authority is found in section 6 of the Rapid Transit Act, so called, as amended by chapter 729, Laws of 1896, for making provision in the plans for the present and future needs of the public for sewers, gas or water pipes or electric wires underneath the surface of the streets under which the railroad is to be constructed, and for the City's charging rental for such use where the right to such use of the street without compensation did not exist. The learned counsel for the relator cites this as authorizing the construction of these conduits and the renting of such of them as may not be needed by the relator. I think authority may there be found for renting to the relator such of them as he needs. It appears, and is not controverted, that at the time the legislation was applied for and when the contract was made it was not contemplated that any permanent conduit would be necessary for conducting the electrical cables, but it was then intended that they should be suspended or placed in the interior of the tunnel and remain of a movable nature. These were the circumstances under which it was provided by the Legislature, and by the contracting parties that whatever conduits might be necessary for the operation of the road should fall within the classification of equipment, the expense of which should be borne in the first instance by the Contractor, the same, however, to be purchased by the City at a fair valuation at the expiration of the lease. The conduits then in contemplation were to constitute *equipment* and upon them as well as the rest of the equipment the City was to have a lien to insure the performance of the contract. By the contract and plans as changed by mutual consent, however, certain conduits, suitable for holding the electrical cables, to enforce payment for which is the object of this proceeding, have become a *permanent* part of the construction and *irremovable* without the destruction of the side walls of the tunnel. These conduits thus forming a part of the permanent construction do not, in my opinion, necessarily fall within the classification of equipment as used in the statute or in the contract. The Commissioners may well have deemed that it was to the benefit and advantage of the City, in its future operation of the road after the expiration of the lease, to have suitable conduits in the side walls for use in transmitting power. I think if the plans had originally so provided there could be no question but that it was the duty of the Contractor to construct them; and, it being his duty to furnish all conduits for equipment at his own expense, he could not then use them without the consent of the City or its authorized representatives. Whether the Contractor is or should be entitled to use these conduits for the electrical cables employed in transmitting the power, is a separate and distinct question not necessarily presented on this appeal which, as has been seen, involves only the *power* of the Commissioners to require their construction. The Commissioners had power, under the statute and reserved in the contract, to alter and change the plans with the consent of the Contractor. We are not concerned with the question whether the Contractor could have been compelled to submit to a change of the plans so as to provide for the construction of these conduits solely for the benefit of the City, for three reasons: *First,* the change was made at his suggestion; *second,* he has consented to it; and *third,* most of the work was done by him at his own risk before the Commissioners formally authorized the change or determined to allow him compensation therefor as part of the construction. Thus the question comes before us as if these provisions had been in the original contract and there had been no express provision that the Contractor should have the use of the conduits gratuitously. One of the grounds upon which the relator recommended this change in the plans is that it will insure greater safety to the public; and this is undoubtedly true. Suppose in addition, he or the Chief Engineer of the Board had also recommended that it would be to the interest and advantage of the City on grounds of economy, on account of the impracticability of making these changes after the expiration of the lease without incurring several times the outlay that will be required in doing the work now, and suppose the Contractor, on account of its being to his advantage also, had offered to pay the fair rental for the use of the conduits, could there be any doubt of the power of the Commissioners, with the consent of the Contractor, to make the changes for these reasons? Is the power of the Commissioners in that regard any less because they may intend to permit the Contractor to use the conduit without paying rental? Is it not apparent that this question as to the use of the conduit by the relator is separate and independent from the power to authorize their construction? The contract expressly provides, as shown in the affidavit by the relator, "the railroad hereby leased includes the railway construction under the routes and general plans * * * together with terminals, stations and all other appurtenances whatsoever of the said railroad, *but not including the equipment thereof.*" Thus it appears that the Contractor not only agreed to furnish all equipment, including conduits, at his own cost and expense, but it was expressly provided that the City did not lease to the Contractor *any equipment.* Therefore, although these conduits are now part of the permanent construction and belong to the City, they will, if used by the Contractor, serve the purpose of part of the equipment which it was originally contemplated was to be furnished and paid for by him; and for the purpose of any application on his part to use them they should be considered as equipment within those provisions of the contract requiring him to provide equipment at his own cost and expense; and since the conduits are not leased to the Contractor he must acquire his right to use them, for he has not that right under the statute or contract as originally made at least. The relator claims that this is now construction, and in this contention we agree. It therefore follows that he cannot use it as equipment as a matter of right, for the City has not agreed to lease equipment, and the use he contemplates making of it is clearly equipment with the fair intent and meaning of the contract, and, according to the understanding of the parties at the time the contract was made which, as shown by the moving papers, contemplated the suspension of the cables within the tunnel. The metallic cables inclosing the copper wires or other electrical conductors are not conduits but those opening in the side walls will be if used for carrying such cables. This construction will result in justice to both parties; the contract permits it and equity requires it. It appears that the expense of providing suitable conduits or conductors for the electrical cables which was to be borne by the Contractor would be very large; and some idea of this expense may be inferred from the fact that the Contractor proceeded with and performed nearly one-half of this work of inserting conduits in the side walls, the aggregate cost of which, according to the affidavit of the Chief Engineer of the Board, will be $1,150,000, before obtaining the formal approval of the Commissioners to a change of the plans or arriving at an agreement as to who was to pay therefor, and during several months he was proceeding under a resolution which required him to bear the entire cost thereof. It is, therefore, just that in being saved this large expenditure of money and greater protection against the liability of accidents he should pay a rental to the City for the use of these conduits; and it is right that the City should pay the cost of construction, since they become its property permanently affixed in the construction and useful beyond the period of the relator's lease. The contractor in dealing with the Commissioners is chargeable with knowledge of the limitations of their powers; and it seems to me that they have not, by failing to have an understanding with him with respect to paying rental, foreclosed the City from asserting a right to recover the fair value of the use of these conduits. All of the provisions of the statute and of this contract have not been drawn to our attention upon this appeal; but unless there are other provisions of the contract, not printed in the record, or of statutes, to which our attention has not been called, controlling on the point, I think that the Commissioners were not and are not justified in permitting the Contractor to use the conduits without paying the City any rental therefor. The Commissioners may have led the Contractor to belive that he is to be permitted to use these conduits gratis; and, if that be the effect of the amended contract and plans, then the question of power on the part of the Commissioners to permit such use without compensation to the City, perhaps embarrassed by a question of estoppel in not having a clear understanding on the subject, may arise in the future, but it is not directly presented and cannot be decided now. However, that does not affect the power of the Commissioners, with the consent of the Contractor, to make the changes in the contract and plans and to obligate the City to pay for the work required thereunder. For these reasons, therefore, I vote for a reversal of the order and for awarding a peremptory writ of mandamus according to the prayer of the petition. *(Reported 80, App. Div. 210; affirmed by the Court of Appeals on the opinion of HATCH, J. in the Court below. 175, N. Y., 470.)*

CIRCUIT COURT OF APPEALS.

SECOND CIRCUIT.

FOWLER

—against—

CITY OF NEW YORK, *et al.*

Appeal from the Circuit Court of the United States for the Southern District of New York.

Appeal from a decree (*110 Fed. Rep., 749*) sustaining the demurrer filed by the defendants, and dismissing the bill on the ground that the patent upon which the bill is based is void for lack of patentability.

EUGENE H. LEWIS, JOHN W. SUGGETT and WILLIAM W. DODGE for appellant.

GEORGE L. RIVES, JOHN R. BENNETT and T. D. MERWIN for appellees.

Before WALLACE and COXE, CIRCUIT JUDGES.

COXE, J.—This is an equity action for the threatened infringement of letters patent, No. 570,451, granted November 3, 1896, to Benjamin F. Carpenter for a "by-transit railway system." The specifications contain five double-column pages of description and ten claims. It explains with painstaking elaboration and minuteness the difficulties encountered in providing rapid transit in large cities, and the remedies proposed by the patentee for overcoming these difficulties.

The defendants demurred upon the ground that the patent upon its face discloses an entire lack of patentable novelty, and that the claims are not for combinations, but for aggregations merely. The demurrer was sustained and the bill dismissed. The complainant appeals.

The first proposition argued is that the patent cannot be considered for the reason that it is not set out in extenso in the bill, or attached thereto.

The bill makes profert of the patent in the following language:

> "Which said letters patent, or an exemplified copy thereof, your orator will produce as your honors shall direct."

This is the usual form of pleading in patent causes; it is simple and convenient and avoids the necessity of copying into the bill long public documents accessible to all. In an infringement suit the foundation of the complainant's case is the patent; without it the action cannot stand for a moment, and when its validity is challenged it is the duty of the complainant to present it to the court for inspection. If the bill be attacked because the patent is not set out at length, the complainant is entitled to produce it in support of the bill, and he will not be permitted to suppress it when its validity is challenged.

There can no longer be a doubt that where, in an infringement suit, profert of the patent is made in language similar to that quoted, supra, the patent is regarded as a part of the bill, and will be examined on demurrer. Heaton Peninsular B. F. Co. v. Schloctmeyer, 18 C. C. A. 674, 69 Fed. 592; Chinnock v. Paterson P. & S. Co. (C. C.), 110 Fed. 199; International Lumber Co. v. Maurer (C. C.), 44 Fed. 618.

Section 4886 of the Revised Statutes provides that "any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof * * * may obtain a patent therefor."

After describing generally what he proposes to accomplish the patentee says:

> "From the above description it will be perceived that my invention furnishes a new method of handling the passengers to secure quick delivery at various points between the ends of an express route."

In other words, the patent describes a new plan for handling the large number of passengers who patronize the public vehicles provided for rapid transit in large cities It is argued that this is patentable as a "machine" under the language of the statute just quoted.

If a scheme for handling the traveling public in congested districts can, for patent purposes, be regarded as a machine, it is by no means easy to perceive why a new plan for reorganizing the police force, or mobilizing the army or manipulating the guests at crowded public functions, may not also be aptly described as a machine and patented as such.

Conceding, arguendo, that a plan such as is disclosed in the Carpenter patent may, if new and useful, be patented as a machine, it is manifest that no mere abstraction, no idea, however brilliant, can be the subject of a patent irrespective of the means designed to give it effect. In the case at bar, patentability must be found, if at all, in the mechanical means and appliances used to carry out the proposed plan. These are all admittedly old. The tracks, turnouts, cars, platforms, motors, loops, partitions, gates and staircases described by the patentee had all been used for years prior to the date of the application to facilitate the transportation of freight and passengers on railways. The feature of the patented system principally relied on to support invention seems to be the arrangement of the tracks, two for express trains and two for local trains, in connection with "island" platforms between the local and express tracks, upon which tracks the trains run in the same direction. By this arrangement a passenger can board a local train, ride upon it until he reaches a station where express trains stop, disembark from the local, cross the platform, board the express and ride upon it until he reaches the express station near his destination, where he may, if he likes, again cross the platform and take a local train which will deposit him still nearer the point he desires to reach. The island platforms are provided with partitions and gates to prevent crowding. Of this plan the patentee says:

> "A conjunctive or co-operative service is thus maintained, and such arrangement and operation I term the 'bi-transit system.'"

While conceding that island platforms were old, he points out the distinction that they were used on roads having two tracks only, and is of the opinion that their use in conjunction with a four-track road is "an entirely novel feature."

The patentee contributes the further information that where the tracks on opposite sides of the platform are not on the same level, "adequate staircases" may be provided for the use of the passengers. Again he says that where the express tracks are located outside of the local tracks the approach to the local tracks may be through openings in the center of the street.

Another "feature" of the system, which is, apparently, regarded as novel, for it is incorporated in the claims, is the introduction of loops or switches by means of which trains may be shunted over from one track to another. It is thus described:

> "The object of the loop is simply to transfer the trains from the up track to the down track at a given point, and such tracks may be connected with the same effect by suitable switches."

We have thus referred to those features which seem to be relied upon by the patentee and by counsel as constituting the essential elements of the "bi-transit system." It is unnecessary to comment upon the remaining suggestions of the specifications, as they deal with the most obvious and commonplace propositions.

After giving careful consideration to the arguments advanced on behalf of the complainant, we find it impossible to discover any ground for sustaining the patent. The rapid transit problem has been for years a most serious one, especially in the City of New York, where the principle obstacles have been lack of space and lack of money to complete such a tremendous undertaking as a suitable subway. Given a four-track road devoted wholly to the transportation of passengers, and any competent railroad engineer would know at once how to manage it. He would know where to locate the stations, loops and switches, and he would assuredly arrange for the ingress and egress of passengers so that they would not be compelled to cross the tracks at grade. To plan all these details would undoubtedly require ability of a high order, but not inventive genius. The organizer of such a system would have all the materials ready at his hand with nothing remaining but to adapt them to the new environment.

The Court will take judicial knowledge of the fact that for a quarter of a century, at least, it has been customary for travelers living at small towns to take local trains to large cities, remain at the station and, upon the arrival of the express, cross the platform and board it. Even if it be true that, prior to 1895, the trains on either side of island platforms ran in opposite directions, it surely did not involve an exercise of the inventive faculties to run these trains in the same direction. As before pointed out, the reason why this was not done before is that there was no necessity for it. The moment that a four-track passenger railroad was projected, the wisdom of such an arrangement was obvious.

The case of Richards v. Chase Elevator Co., 158 U. S. 299, 15 Sup. Ct. 831 39 L. Ed. 991, is directly in point. The alleged invention consisted in apparatus for transferring grain from one car to another. The court held the patent void on demurrer and, in order to emphasize the absurdity of the complainant's contention, used language which seems almost prophetic of the "bi-transit" system. The Court says:

> "Suppose, for instance, it were old to run a railroad track into a station or depot for the reception and discharge of passengers, it certainly would not be patentable to locate such stations between two railroad tracks for the reception of passengers on both sides, and to add to the accommodations a ticket office, a newspaper stand, restaurant, and cigar stand, or the one thousand and one things that are found in buildings of that character."

Compare this language with the following quotation from the Carpenter patent:

> "Safe and convenient access to the transfer platforms is then effected by extending staircases upward or downward to the street (as the case may be), and the platforms thus furnish not only the shortest and easiest means of transfer between the cars of the slow and fast trains, but may, when required, afford means of access to and from the street, and accommodations for stations purposes with ticket office and waiting-room."

We have considered each of the claims separately, and find that the same difficulty is applicable to all, namely, an entire lack of patentable novelty.

We are of the opinion that the decree of the Circuit Court is right and should be affirmed, with costs.

(Reported 121 Fed. Rep. 747.)

SUPREME COURT,

COUNTY OF NEW YORK.

IN THE MATTER, ETC.,
of
WILLIAM J. REILLY.
SPECIAL TERM.

CLARKE, J.—The relator prays for an alternative or peremptory writ of mandamus directed to the Board of Rapid Transit Railroad Commissioners and a division engineer, commanding them to restore relator to the position of Inspector of Sewer Construction, and to pay him salary accrued since his removal. The respondents allege that relator was suspended and subsequently dismissed for lack of work, his name transmitted to the Municipal Civil Service Commission for reinstatement, and that eighteen days later he was reinstated as Inspector in the Bureau of Sewers, pursuant to section 1543 of the Greater New York Charter.

In so far as the application is for a peremptory writ, the relator in effect demurs to the facts alleged by respondents. A removal for purposes of economy has been held to be a mere suspension, and by analogy with previous decisions it has been held that a peremptory writ will not be granted under the circumstances set forth. (People ex rel, Levinson vs. Wells, 78 App. Div. 373.)

The relator, however, does not insist upon a peremptory writ, but, upon its denial, prays for an alternative writ. He denies that the true ground of his removal was lack of work, and alleges that the cause of his removal was a charge that he had allowed improper materials to be used upon the work, and that he was discharged without an opportunity of making an explanation, in violation of section 1543 of the Charter. As a question of fact is presented the relator may have an alternative writ that the issues raised may be determined in the manner provided by statute (People ex rel. Corrigan vs. Mayor, etc., 149 N. Y., 215; People ex rel. Vanderhoof vs. Palmer, 3 App. Div., 389).

The new employment alleged does not necessarily bar the relator from contending against the alleged unlawful removal. The alleged reappointment of relator is entirely consistent with the theory advanced by respondents, as reinstatement is obligatory under the statute where there has been a lawful suspension. As, however, the respondents in no way concede that relator was illegally removed nor admit that during the period of suspension the relator was entitled to the office claimed and the salary incident thereto, such plea would not be a complete defense, and does not avoid the necessity of determining the issue raised.

Motion for alternative writ prayed for is granted.

SUPREME COURT.

APPELLATE DIVISION.

CHARLES T. BARNEY, Appellant,

vs.

THE CITY OF NEW YORK and Others, Respondents.

ARTHUR H. MASTEN, for appellant.
THEODORE CONNOLY, for respondent, City of New York.
EDWARD M. SHEPARD, for respondent, Rapid Transit Board.
DELANCEY NICOLL, for respondent, John B. McDonald.

INGRAHAM, J.:—This appeal is from an order of the Special Term denying a motion for an injunction restraining the defendants from further excavating, blasting or constructing the rapid transit tunnel for the underground railroad under Park avenue adjacent to the plantiff's premises, or from continuing the work of tunnel construction in such a manner that the easterly side of the tunnel or of the excavation therefor, shall be nearer to the building or house line than the tunnel described and shown in the routes and general plan adopted and approved by the defendants, the Rapid Transit Railroad Commissioners. The plantiff is the owner of a dwelling house on the east side of Park avenue, at the corner of Thirty-eighth street. In pursuance of legislative authority and the consent of The City of New York, the Rapid Transit Commissioners prepared a general plan for the construction of an underground railroad in The City of New York. That general plan was approved by the municipal authorities, but the property owners having refused to consent to the construction of the road, application was made to this court for authority to construct and operate the said road, notwithstanding such refusal. The plans as prepared by the Rapid Transit Commissioners, and which were submitted to this Court for approval, contemplated three separate tunnels under Park avenue, in front of the plantiff's premises, the easterly side of the easterly tunnel being thirty-seven feet and six inches from the buiding line of the property on the east side of Park avenue. The centre tunnel was twenty-four feet in width, and constructed in the middle of the avenue, and was separated from the east tunnel by a masonry wall. The centre tunnel was to contain two tracks, while the easterly tunnel was to contain one track, and it was this method of construction that was approved by this Court. After such approval, the Commissioners of Rapid Transit made the detailed plans necessary for a contract to construct the road. Upon a further consideration, the original plans were modified by substituting for the three tunnels orginally proposed, two tunnels, one upon the east and the other upon the west side of Park avenue, the east side tunnel being thirty-five feet from the building line of the abutting property on the easterly side of Park avenue. The contract was made between the Commissioners of Rapid Transit and the defendant McDonald, for the construction of the road according to these modified plans. Subsequent to the execution of this contract, a further modification of these plans was considered necessary by the Chief Engineer in charge of the work, and such modification was directed by him without any formal action of the Rapid Transit Board, and without the consent of either the property owners or of this Court. By this modification, the easterly tunnel was located on the east side of Park avenue, about seven feet from the building line of the property. The construction of this easterly tunnel was prosecuted under the authority of the Chief Engineer of the Board of Rapid Transit Commissioners, with the approval of the engineer of the contractors, but without other authority. After the excavation was substanially completed, at a cost to The City of New York of upwards of $400,000, this action was commenced to enjoin the further construction of this tunnel under Park avenue, and to compel the defendants to fill up the excavation already made and to proceed with the plans as orginally proposed.

The evidence is that it would cost The City of New York to comply with this demand in the neighborhood of $500,000, in addition to the money already spent, and would delay the completion of the work for about eighteen months; and the question that was presented to the Court below was, whether in view of these facts, in the exercise of its judicial discretion, this work should now be stopped, entailing upon the public and the City this delay in the prosecution of the work, with the large additional cost indicated. It is undoubtedly true that this modification of the plans, materially changing the relation of the proposed road to the abutting property without the consent of the property owners, or in lieu thereof the approval of this Court, was entirely unauthorized. The constitutional provision, recognized and enforced by the statutes under which this road is being constructed, by which this railroad could not be built without the consent of the property owners, or in lieu thereof the approval of this Court, provided safeguards for the protection of property abutting upon a street through or under which it was proposed to construct a railroad. Before such a road should be constructed, the abutting owners were to be consulted; but in order to prevent the opposition of the property owners from preventing a necessary public improvement, provision was made by which an approval by this Court for the construction of such a railroad could take the place of the consent of the property owners; but that was only to be done where notice to the property owners was given so that they could be heard in opposition to the construction of the road; and the application to this Court for its approval was necessarily based upon the plans for the construction and location of the proposed road, so that the property owners could have an opportunity of presenting their objections to the road as it was proposed to be constructed and located. Before a tunnel within seven feet of the property was authorized, the abutting owners had the right to be heard and present their objection to a tunnel so located.

We will assume, therefore, in the dispsition of this application, that the change of location was unauthorized, and if before any work had been done or substantial progress had been made in the excavation an application had been made for an injunction, that the Court would have been justified in restraining the further prosecution of the work until the necessary consents had been obtained. An entirely differnt question is presented where the application for an injunction is made after the excavation of the tunnel has been substantially completed and where all that remains is to construct the necessary masonry walls and supports. That it would be a much more serious injury to the plantiff's property to leave the excavation in the condition in which it was when this action was commenced than to allow it to be proceeded with and the necessary walls and supports constructed, is apparent. The only result of now granting a preliminary injunction would be to stop the work, leaving this hole in the ground unsupported; while if the contractors are allowed to proceed with the construction of the tunnel, the adjourning property would be secure against further settling or injury. The injunction asked for, therefore, would seem to be without any advantage to the plaintiff, but would subject him and the other property owners to the danger of having the adjacent rock settle into this excavation and so injure rather than protect his property.

The learned counsel for the plaintiff insists that the operation of the road in this tunnel will be a serious injury to his property, and for that reason the further construction of the tunnel, as at present located, should be enjoined. But we think the question of the operation of the road should be left until it can be determined, by its actual operation, whether or not such operation will entail upon the adjoining property any injury or disadvantage. The importance of this public improvement, the fact that it has involved the expenditure of such a large amount of public money, and the necessity for additional means of transportation of passengers in New York, are facts which should be considered in determining whether the Court should interfere by an injunction which would prohibit the completion of the public improvement, or adopt other methods to protect or compensate the abutting property owners. The question is whether there should be a preliminary injunction pending the trial of the action; and we think in view of the situation, the enormous public interests involved, and in view of the facts that such an injunction, while affecting most seriously the defendants, would be of no advantage to the plaintiff or the abutting owners, that the Court, in the exercise of the judicial discretion which it is bound to exercise in considering an application of this kind, was quite justified in refusing to grant the preliminary injunction asked for, leaving the question of the relief to which the plaintiff would be entitled to be determined upon the trial. Without attempting at all to indicate an opinion as to what the Court should do when the question as to the final judgment is presented, we affirm the order appealed from as a proper exercise of discretion in refusing to grant an injunction before judgment.

It follows that the order appealed from should be affirmed, with $10 costs and disbursements.

VAN BRUNT, P. J., McLAUGHLIN and LAUGHLIN, JJ., concurred.

(Reported 83 App. Div. 237.)

APPENDIX III

CERTIFICATE OF THE BOARD
TO THE
HUDSON AND MANHATTAN
RAILROAD COMPANY

BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS FOR THE CITY OF NEW YORK

TO

HUDSON AND MANHATTAN RAILROAD COMPANY.

CERTIFICATE, NOVEMBER 24TH, 1903.

The Board of Rapid Transit Railroad Commissioners for The City of New York does hereby certify as follows:

WHEREAS, The Hudson and Manhattan Railroad Company (which is hereinafter called *the Tunnel Company*) is a railroad corporation which has been duly incorporated under the laws of the State of New York for the purpose, so declared in its articles of association, of constructing and operating a tunnel railroad from a point at or near the intersection of Broadway with Cortlandt Street in the City of New York (hereinafter called *the City*), and thence, by a feasible route, beneath the surface in the City and under the bed of the Hudson river to a point under the waters of the Hudson river in the boundary line between the States of New York and New Jersey (opposite a point lying between Liberty and Fulton streets, in the Borough of Manhattan, in the City), where the said railroad is to connect with the railroad of a corporation organized or to be organized under the laws of New Jersey, extending westwardly to a point or points in the city of Jersey City and State of New Jersey, and thereby forming a continuous line for the carriage of passengers and property between a point or points within and a point or points without the City of New York; and

Whereas, The Tunnel Company, pursuant to section 32 of chapter 4 of the laws of 1891, as amended by chapter 584 of the laws of 1902 (which entire statute as amended by various acts and as now in force is hereinafter called *the Rapid Transit Act*) has made application to the Board of Rapid Transit Railroad Commissioners for the City of New York (which is hereinafter called the Board) for authority to lay railroad tracks along a certain route from its terminal in the City westwardly to the Hudson river, and to have and maintain in the City a terminal station and such terminal and other facilities as may be necessary for the accommodation of the traveling public, and to construct and operate its railroad along the said route and under lands, streets, avenues, waters, rivers, highways and public places in the City, with necessary sidings, platforms, stations, faciliaies for access to the surface and other appurtenances and with the right to emerge to the surface upon private lands at the terminus thereof in Manhattan Borough, all as hereinafter particularly set forth, and to transport over the said railroad passengers or freight, or both; and

Whereas, The Board by a concurrent vote of at least six of its members has fixed and determined the locations and plans of construction of such railroad of the Tunnel Company upon such route and of such tracks and facilities, the times within which they shall be respectively constructed, and the compensation to be paid therefor to the City by the Tunnel Company; and

Whereas, The Board, by such concurrent vote, has prescribed such terms, conditions and requirements as to the Board appear to be just and proper for the grant hereby made to the Tunnel Company, including the terms, conditions and requirements provided by the Rapid Transit Act, and has included among them a provision that the Tunnel Company shall from the time of the commencement of the operation of such railroad under such determination, annually pay to the City a sum or rental for a period of twenty-five years, beginning with such operation, and also providing for a readjustment of the amount of such sum or rental at the expiration of such period and at intervals thereafter of twenty-five years,—

Now, therefore, the Board has authorized and does hereby authorize, but subject, however, to the limitations, terms, conditions and requirements hereinafter set forth, the Tunnel Company—

1. To lay down, construct and operate a railway, including two tracks, on a route beginning at the boundary line between the States of New York and New Jersey under the Hudson river, at a point nearly opposite the foot of Cortlandt street, in the Borough of Manhattan; thence running eastwardly under the Hudson river and dock or bulkhead property on the easterly bank thereof, whether belonging to the City or to other owners, to the westerly side of West street at a point opposite or nearly opposite or at the foot of Cortlandt street ; and thence still eastwardly crossing under West street, and thence still easterly under Cortlandt street, crossing under Washington street and Greenwich street, to a point in Cortlandt street west of and at or near the westerly line of Church street, and thence curving northwardly and passing under private property and crossing under Dey street and thence again under private property to Fulton street west of and at or near the westerly line of Church street; thence curving to the west into Fulton street; thence westwardly under Fulton street, crossing under Greenwich street, Washington street and West street, and thence still westerly to the westerly side of West street, and thence still westwardly, under dock or bulkhead property on the easterly bank of the Hudson river, whether belonging to the City or to other owners; and thence still westwardly under the Hudson river to a point in the boundary line between the States of New York and New Jersey, nearly opposite the foot of Fulton street.

2. To acquire and maintain a terminal and station in the easterly portion of the blocks bounded by Greenwich street, Cortlandt street, Church street and Fulton street, in Manhattan Borough, the same being private property, or so much thereof as the Tunnel Company may find necessary and be able to acquire,

and also to occupy for said terminal and station all or any parts of the underground portions of Cortlandt, Dey and Fulton streets, in Manhattan Borough, contiguous to its said terminal station in said blocks, and to lay and operate therein such tracks, sidings and connections as may be found convenient for the operation of the railroad.

3. To build, maintain and operate a subway for foot passengers under Dey street from the said terminal and station at the westerly side of Church street to Broadway, and thence crossing under Broadway to John street, to connect the terminal and station of said Company with the station of the Rapid Transit Subway at Dey street and John street and Broadway; and there connecting with the stairways leading from such subway stations to the surface of Dey and John streets. But nothing in this subdivision contained shall imply any obligation on the part of the City to provide or maintain any such station of the Rapid Transit subway.

4. To run upon said railways (all of which railways upon the route aforesaid, together with the said terminal stations and facilities, and all their appurtenances, are together hereinafter called the Railroad) motors, cars and carriages for the transportation of persons and property, and to use thereon and in connection therewith all suitable railroad appliances.

5. To maintain and operate under the streets of the routes aforesaid and along the lines of the said railways composing the Railroad, for the use of the Railroad only, telegraph wires and wires, cables, conduits and ways for the distribution of power, heat and light and other appurtenances.

6. To acquire and use for stations or station extensions, power plants, pumping stations, shafts for access to the surface and other necessary purposes of the Railroad, private property as the same may be lawfully acquired within the scope of the corporate rights and powers of the Tunnel Company.

The rights hereinbefore granted to maintain and operate the Railroad or necessary or convenient for that purpose shall be held by the Tunnel Company in perpetuity, except as may be herein otherwise expressly provided.

PROVIDED, however, and it is expressly agreed that this authorization and the rights and privileges hereby granted are subject to certain limitations, terms, conditions and requirements which appear to the Board to be just and proper, and as so subject are hereinafter called the Franchise hereby granted. The said limitations, terms, conditions and requirements are hereby prescribed as follows, to wit:

I.

This certificate will be executed by the Board in four identical originals, so proved as to be entitled to be recorded in the office of the Register of the County of New York and to be filed in the office of the Secretary of State of the State of New York, all of which will be delivered by the Board to the President, Vice-President, Secretary or Treasurer of the Tunnel Company. The franchise hereby granted shall be inoperative and this certificate shall be void unless within thirty days after such delivery or such further period as shall be prescribed in writing by the Board, the Tunnel Company shall have procured three of the said identical originals to be returned to the Board, each of them having an acceptance of the Franchise and all the limitations, terms, conditions and requirements thereof subscribed at the foot thereof by the Tunnel Company, such acceptance being so proved as to entitle it to be recorded and filed as aforesaid.

II.

The Franchise hereby granted shall, if the Board shall so determine, become void unless within three calendar months after the time of the delivery to the Board of the acceptance of this Certificate by the Tunnel Company, that Company shall, in due and lawful form, obtain or receive all the consents and approvals following, to wit:

1. The consent of the Board of Aldermen of the City, being the local authority having the control of the portions of the streets and highways upon or under which it is proposed to construct the Railroad, together with the approval of the Mayor of the City.

2. The consents of the Department of Docks and Ferries and the Commissioners of the Sinking Fund of the City, if and so far, if at all, as such consents or either of them may be necessary to the construction, maintenance and operation of the Railroad, or any part thereof, under docks or other property belonging to the City of New York.

If it shall appear that any consent herein required is not necessary, the Board shall have power to waive the same; and in such case the Franchise hereby granted shall be deemed as effectually granted as if the consent were given. So also if the Tunnel Company shall surrender or waive any right for which a consent cannot or shall not be obtained, then and in such case the Board shall have power to waive the procurement by the Tunnel Company of such consent; and in such case the Franchise hereby granted shall not, except as to such right, be prejudiced by the absence of such consent.

The Franchise hereby granted shall, if the Board shall so determine, become void unless within one year after the time of the acceptance of this certificate by the Tunnel Company, that Company shall further and in due and lawful form, obtain the consent of the owners of one-half in value of the property bounded on the portion of each street under or through which the Railroad or any part of the route thereof runs, to the construction and operation of the Railroad, or such part thereof, or in case the consent of such property owners cannot be obtained then the determination of commissioners to be appointed pursuant to law by the Appellate Division of the Supreme Court in the First Department that the part of the Railroad under or through said street ought to be constructed and operated, the said determination of such commissioners, when confirmed by the Appellate

Division which shall have appointed such commissioners to be taken in lieu of such consent of property owners, Provided, however, and it is expressly stipulated, that the Board shall have power, upon reasonable cause shown, to extend by written certificate either of the periods hereinbefore in this article prescribed.

If the Tunnel Company shall be diligent in prosecuting applications for the consents aforesaid, and shall not have secured the same other than such, if any, or shall have been so waived, within the period of one year after its acceptance as aforesaid of this Franchise, then and in such case the Tunnel Company shall, after a written notice of three months to the Board, be released from its obligations hereunder, unless within such three months such consents shall have been given.

III.

The Tunnel Company shall begin the construction of the Railroad within three months after it shall have obtained the consents aforesaid or such of them as shall be necessary as aforesaid and shall not have been waived as aforesaid, and shall complete the construction of the Railroad within five years after such construction shall be begun.

In case the Tunnel Company, within the period of three months after it shall have obtained the consents necessary as aforesaid, shall not have begun the actual construction of the Railroad, or if, after having begun such construction, it shall suspend the same prior to the completion thereof for a period exceeding three months, or if it shall not complete such construction and begin the operation of the Railroad within the said period of five years, then and in either of such cases the Board, upon a written notice to be delivered to the Tunnel Company not less than three months before the action of the Board, may annul the Franchise hereby granted as to any part of the Railroad not then completed and in operation; Provided, however, that the Board shall have the power, upon reasonable cause shown, to extend by written order any of the periods in this article prescribed; and Provided, further, that additional time shall be allowed by way of extension of any period for such commencement of construction or for the completion thereof, or for the commencement of operation of the Railroad equal to the total period of delay caused by injunction or by necessary proceedings for condemnation of real estate, easements or other property, so far as such proceedings shall necessarily prevent the Tunnel Company from prosecuting such construction, but no delay to be so allowed for unless, during the same, such proceedings shall be diligently prosecuted by or for the Tunnel Company; and PROVIDED, further, that in no case shall such delay be deemed to begin until the Tunnel Company shall have given written notice to the Board of the injunction or other occasion of delay and delivered to the Board copies of the injunction or other orders and of the papers upon which the same shall have been granted, and unless, upon the request of the Board, the Tunnel Company shall in writing consent that the Board, either in its own name as a party or in the name of the City of New York as a party, may intervene in any such injunction proceedings, or other suit or proceeding; and PROVIDED, further, that in case of annulment of any part of the franchise the Tunnel Company shall have no right to any return of payments which it shall have made to the City by way of rental or otherwise.

IV.

The Tunnel Company shall pay to the City for the rights, franchises and licenses hereinbefore granted to construct and maintain its said railways under the bed of the Hudson River outside of the pier head lines, or so much of the railway as shall be thereunder, the sum of One hundred dollars ($100) for each year beginning on the date on which the Tunnel Company shall first commence the actual operation of the Railroad (but such date not to be later than the last day on which the Tunnel Company shall be bound to begin such operation) and ending on the day twenty-five years next thereafter.

The Tunnel Company shall pay to the City for the rights, franchises and licenses hereinbefore granted to construct, maintain and operate its said railways under the docks and bulkheads belonging to the City (and including all space occupied between any pier head line and the part of West street, Cortlandt street or Fulton street nearest thereto, under which said Railroad shall be laid) for each year beginning on the date on which the Tunnel Company shall first commence the actual operation of the Railroad (but such date not to be later than the last day on which the Tunnel Company shall be bound to begin such operation) and ending on the day ten years next thereafter, a sum equal to fifty cents (50c.) per annum for each linear foot of single railway track which shall be then constructed or which the Tunnel Company shall be bound to have then constructed under such docks and bulkheads, and the sum of One dollar ($1) per annum per linear foot of such tracks for the period beginning on the last day of the said period of ten years and ending on the day fifteen years next thereafter.

The Tunnel Company shall pay to the City for the rights, franchises and licenses in and under streets hereinbefore granted from West street to the underground street spaces east of Greenwich street for which it shall pay a rate per square foot of superficial area as in the next paragraph of this article provided and for the right to maintain a subway for foot passengers under Dey street and Broadway, the sum of fifty cents (50c.) per annum for each linear foot of single railway track, or of such subway, which shall be then constructed or which the Tunnel Company shall be bound to have then constructed under any such streets, or parts of streets, within the City of New York during the period beginning on the day when the Tunnel Company shall first commence actual operation of the Railroad (but not later than the last day on which the Tunnel Company shall be bound to begin such operation) and ending on the day ten years next thereafter, and the sum of One dollar ($1) per annum for each linear foot of such tracks and such subway for foot passengers under Dey street and Broadway during the period beginning on the last day of such period of ten years and ending on the day fifteen years next thereafter.

The Tunnel Company shall pay to the City for the underground portions of Cortlandt, Dey and Fulton streets, in Manhattan Borough, contiguous to its terminal station and for the portions of Cortlandt and Fulton Streets in which its tunnel shall approach within fifteen feet of the surface of the street a sum equal to forty cents (40c.) per superficial square foot of space occupied under the streets per annum, such rental to begin on the day of the commencement of construction therein by the Tunnel Company (but such date not to be later than the last day on which the Tunnel Company shall be bound to begin such construction) and to continue during the period of ten years next thereafter, and a sum equal to eighty cents (80c.) per superficial square foot of space occupied under the streets per annum for the period of fifteen years next after such first period of ten years.

The Tunnel Company shall pay to the City for the rights under streets of the City hereinbefore granted the further sum of Nine thousand dollars ($9,000) per annum for each year beginning on the date on which the Tunnel Company shall first commence the actual operation of the Railroad (but such date not to be later than the last day on which the Tunnel Company shall be bound to begin such operation) and ending on the day ten years next thereafter, and the sum of Fifteen thousand dollars ($15,000) per annum (the same being five per cent. per annum on such gross earnings as so fixed) for the period beginning on the last day of the said period of ten years and ending on the day fifteen years next thereafter. Such annual sum of $9,000 is three (3) per cent. and such annual sum of $15,000 is five (5) per cent. on the gross earnings of the New York portion of said Railroad, said gross earnings being estimated and fixed for the purposes of this grant at Three hundred thousand dollars ($300,000) per annum for the period of twenty-five years from the date on which the Tunnel Company shall first commence the actual operation of the Railroad, but such date not to be later than the last day on which the Tunnel Company shall be bound to begin the actual operation of the Railroad.

All such payments shall be made to the Comptroller of the City in equal payments at the end of each quarter year on the first days of January, April, July and October in each year.

The annual amounts to be paid by the Tunnel Company as aforesaid shall be readjusted at the end of the first period of twenty-five years, and shall thereafter be readjusted at intervals of twenty-five years. The annual amounts to be paid by the

Tunnel Company for each and every period of twenty-five years after such first period shall be determined as follows, to wit: Each such determination shall be had upon the application of either the Tunnel Company or the Board or any authority which shall be authorized by law to act for the City in place of the Board. Such application shall be made at any time not earlier than two years and not later than one year before the expiration of the preceding period of twenty-five years. The determination shall be sufficient if agreed to in writing by the Tunnel Company and the Board or such other authority in its place. If the Tunnel Company and the Board or such other authority in its place for the City shall not reach such agreement on or before the day one year before the expiration of such preceding twenty-five years period, then the annual rate of compensation for such succeeding twenty-five years period shall be reasonable; and either the City (by the Board or such other authority in its place) or the Tunnel Company shall be bound, upon request of the other, to enter into a written agreement with such other fixing the rate of such compensation at such amount as shall be reasonable, and if the parties shall not forthwith agree upon what is reasonable, then the parties shall enter into a written agreement fixing such annual rate at such amount as shall be determined by the Supreme Court of the State of New York to be reasonable; and either party may in any case apply to the said Court to fix such rate. If, in any case, the annual rate shall not be fixed prior to the commencement of such succeeding twenty-five years period, then the Tunnel Company shall pay the annual rate last theretofore prevailing until the new rate shall be determined and shall then make up to the City the amount of any excess of the annual rate then determined over the previous annual rate. But in no case shall any amount so readjusted be less than the corresponding amount in force at any time during the preceding period of twenty-five years.

V.

The railways forming part of the Railroad, where the same shall occupy parts of streets, shall be in tunnel or tunnels under the streets, and the Tunnel Company may construct the railways under the Hudson river and under West, Cortlandt and Fulton streets hereinbefore mentioned in tunnels containing one or more tracks, as it may find most advantageous.

No part of the structure of the Railroad, except its terminal station, shall approach within five feet of the exterior line of any street (except such portions of the streets which it shall cross as are within or between two lines parallel with the centre line of the street along which the route is laid at such cross street, one of such lines being five feet from one side and the other of such lines being five feet from the other side of such street of the route), unless the abutting property shall be owned by the Tunnel Company, or unless the owner or owners of the property so abutting shall consent. The tunnel or tunnels, except as hereinbefore limited, may be placed in such places under the streets as may be found most convenient. The uppermost part of any tunnel under any of said streets shall not approach nearer than sixteen feet and eight inches to the surface of any street except that in Cortlandt street and Fulton street between the easterly side of Greenwich street and the said terminal station the tunnel may, according to the necessities of its grade, approach within not less than three feet and six inches of the surface, and in the said terminal station and under Dey street the top of the tunnel may approach within not less than three feet and six inches, and in the portions of Cortlandt, Dey and Fulton streets opposite the said terminal station the top of the tunnel may come within not less than three feet and six inches, of the surface of the roadway or sidewalk.

The Board or the City shall have the right to remove or authorize the removal of any part of the roof of any such tunnel on Greenwich street for convenience in construction of any structure authorized above such tunnel in said street, but in such case such removal shall take place without interference with the operation of the railroad and said roof shall be rebuilt by or under the authority of this Board or City as speedily as possible, and the cost of such removal and rebuilding shall be borne by the City.

Such subway for foot passengers under Dey street and Broadway shall not exceed in width over all fifteen feet; nor shall any part of it approach within nearer than twenty-five feet of the surface of the street. It shall be placed under such portion of the street as shall be required in writing by the Board. If, after it shall be built, any railroad or other use which the Board or the City shall propose for the portion of Dey street or Broadway occupied by such subway shall make necessary or convenient an alteration in the position of such subway either laterally or by raising or lowering the same, then such alteration shall, upon the requirement of the Board or City, be forthwith made by the Tunnel Company, or if thereupon the Tunnel Company shall not forthwith make such alteration, then the same may be made by or under the authority of the Board or the City, and in such case the Tunnel Company shall pay the cost of such alteration. Or if any such railroad or other use so proposed by the Board or City shall necessitate the entire closing of such subway, the same may be closed by or under the authority of the Board or the City, and the space occupied thereby applied to such use so proposed by the Board or City. In case of any such alteration or closing of such subway there shall be no reduction in the amounts or rentals to be paid to the City as aforesaid except that in case of total closing, the annual charge of 50 cents or $1 per linear foot of such subway shall not be made.

PROVIDED, however, and it is expressly stipulated that the Tunnel Company shall in the course of construction at its own expense maintain and care for all underground structures; and any necessary interference with underground structures shall be subject to reasonable regulation by the department of the government of the City in control or charge thereof.

The Tunnel Company shall at all times, by suitable bridging or other supports, maintain and support in an entirely safe condition for their usual service and to the reasonable satisfaction of the owners, all elevated railroad structures, street tramways of whatever character, water and gas mains, steam pipes, pneumatic tubes, electric subways, sewers, drains, and all other surface or subsurface structures encountered during the progress of the work. The sidewalks, curbs, areas and stoops along the line of the work must also be protected from any injury; but should any injury occur to any sidewalk, curb, area or stoop, the Tunnel Company shall fully restore the same to as good a condition as existed before the injury was done. Notice is to be given by the Tunnel Company to all companies of persons and the proper city officials owning or having charge of surface or subsurface structures along any part of the work, of its intention to commence operations along such part of the route, at least one (1) week in advance, and the Tunnel Company shall file with the Board at the same time a copy of said notice; and it shall co-operate with the proper officers or officials or other persons lawfully in charge of such structures and shall furnish them with all reasonable facilities to inspect the methods of caring for their property. Whenever it becomes necessary to cut, move, change, or reconstruct any such surface or subsurface structures, or connections therewith, such work shall be done according to the reasonable satisfaction of the owners of such pipes or other structures or such persons lawfully in charge thereof, and, should they so desire, by the owners themselves, but at the expense of the Tunnel Company,—such expense not to exceed the actual cost of labor and materials used, together with a reasonable allowance for the use of plant and tools not exceeding seven and a half (7½) per cent. All such work of reconstruction or alteration of surface or subsurface structures if performed by the City or owners or persons lawfully in charge thereof, shall be done with reasonable dispatch, and facilities are to be provided so that said work shall interfere as little as possible with the practical working and use of the Railroad of the Tunnel Company. The failure of the City or other such owners or persons lawfully in charge of such structures to make such alterations within what the Board shall determine to be a reasonable time may be considered by the Tunnel Company as a waiver on the part of the City or other such owners or persons of the priority of right to do said work. In the event of the City or other such owners or persons, being required to make any alteration to their surface or subsurface structures as above provided, or in case the City or such owners or persons shall consider it necessary or desirable to make any further alterations in, or do any work to or in connection with surface or subsurface structures owned by or lawfully in charge of them, or any of them, at the time the work of the Tunnel Company shall be in progress, the Tunnel Company shall give said City or other owners or persons all reasonable opportunity to make such alterations or perform such work.

The Tunnel Company shall at all times keep paved with smooth pavement in such manner as may be reasonably required by the municipal authorities having care of the streets, and shall at all times keep in thoroughly good condition that portion of Dey street adjoining or contiguous to the terminal station of the Tunnel Company.

The Tunnel Company shall make good to the City all damage which shall be done to the property of the City by the construction or operation of the railroad and shall make good to every owner of property abutting upon the railroad, or which shall be injured by the work of construction or by operation thereof, all damage which shall be done to such abutting or injured property through any fault or negligence of the Tunnel Company or successor thereof or of any contractor, sub-contractor or other person in the course of any employment upon the construction or operation of the railroad or any part thereof.

The method of construction shall be generally as follows: The tunnels under rivers and streets shall be constructed in whole or in part of masonry or of steel or of iron or any two or more thereof combined. Excavations necessary in the course ot construction by the Tunnel Company shall be made without disturbing the surface of the streets, except the portions of Cortlandt, Dey and Fulton streets adjoining the terminal station aforesaid; PROVIDED, however, that the Board may, wherever elsewhere local conditions make excavations from the surface necessary for efficient construction, grant the right to make such excavations from the surface, subject to such conditions as the Board may prescribe.

The tracks shall be constructed of the most approved plan so as to avoid noise or tremor.

All plans for, and the method of doing, the work shall from time to time be subject to the approval of the Board.

VI.

The power to be used shall be electricity or such other power (not involving combustion in the Tunnel) as may be approved by the Board.

VII.

The plan and profile of the Railroad herewith attached are to be deemed a part of this franchise and to be construed with the text hereof. The same shall be substantially followed, but deviations therefrom not inconsistent with the other provisions hereof may be permitted by the Board.

VIII.

The Tunnel Company shall have no power to carry on merely local traffic unless with the approval of the Board and the Board of Aldermen and Mayor of the City and for such additional consideration to be paid to the City as they shall prescribe Local traffic shall be deemed to include the carriage of passengers or freight between the terminal station of the Tunnel Company and any point in the City of New York, or between stations within said City.

IX.

The Railroad shall be diligently and skillfully operated with due regard to the convenience of the traveling public, so long as the Franchise hereby granted shall remain in force. In case at any time, in the opinion of the Board, the Tunnel Company shall fail to carry out the foregoing provision, in any proceedings which may be instituted by any proper authority to compel a compliance therewith the burden of proof shall be upon the Tunnel Company to show that it is discharging the duties and obligations imposed by this section.

X.

The City shall have a lien upon the Franchise and upon the real property of the Tunnel Company under the said river and streets to secure the payment of such compensation and rental.

In case of any failure to make such payments as herein prescribed, the lien aforesaid may be enforced by the Board or by any authority which shall be authorized to act for the City in place of the Board, either by entry, foreclosure or other proper proceeding and by sale of such Franchise and real property.

The Board may, in its own name, or in the name and behalf of the City, bring action for specific performance, or may apply by mandamus, to compel the performance by the Tunnel Company of the duties and obligations hereby imposed upon the said Company, or any of them. And the Board may, in behalf or in the name of the City, bring action or proceedings to recover possession of any part of the property of the City to be used by the Tunnel Company as aforesaid, or to enforce the said lien of the City, or to enforce any part of this contract in the manner provided by section 9 of the Rapid Transit Act or any other proper action or proceeding.

XI.

The Tunnel Company will not at any future time oppose, but shall at any time upon the request of the Board consent to, the construction of any railroad over, along or under any portion of any of the said streets to be occupied by the Railroad of the Tunnel Company aforesaid, where the same shall not actually interfere with the structure of the Tunnel Company as herein authorized.

The City reserves the right at any time hereafter prescribed, to require a readjustment or alteration of the location of the said tunnel of the Tunnel Company within the limits of Cortlandt and Fulton streets and of the location of the portion of the terminal station under Dey street. Such right is to be exercised only when some rapid transit railroad or other municipal use of such streets shall be of materially greater importance than the cost and inconvenience incident to such readjustment or alteration. No such readjustment or alteration shall be so made as to preclude the operation of the railroad of the Tunnel Company upon the route granted by this franchise, provided, however, that such readjustment or alteration shall be within the right of the City if it involves no more than practicable alteration of grade or other alteration or readjustment which, although involving a less degree of convenience in the operation of the railroad, shall not in any respect substantially, and more than temporarily, obstruct such operation. In case the City shall so require any such readjustment or alteration, the same shall be done at the expense of the City, and the Tunnel Company shall be indemnified by the City against all loss of every character resulting from such alteration or readjustment, including loss from any suspension of traffic, delay or other damage incident thereto.

XII.

The City, the Board and all duly authorized representatives of the City, shall have the right at all reasonable times to inspect the Railroad and any part thereof, and to enter thereon when necessary for the examination, supervision or care of any property of the City or for any proper purpose.

XIII.

The Tunnel Company shall, from time to time, maintain and strengthen all parts of the Railroad which shall be under any street or avenue, so that the same shall safely support any structure superimposed or which shall be superimposed thereon by the City or under its authority or under any other public authority.

XIV.

The Tunnel Company shall have the right to grant, convey, mortgage, assign or transfer the Franchise hereby granted, PROVIDED, however, that every grantee, assignee or transferee thereof, not including, however, a mortgagee or mere lienor, but including any purchaser upon foreclosure of or under or by virtue of any provision of any mortgage or lien, shall be a corporation subject to the laws of the State of New York and shall, upon accepting the grant, assignment or transfer and before such grant, assignment or transfer shall be valid, assume and agree to perform all of the obligations which by the provisions hereof are assumed by the Tunnel Company, and that no such grant, conveyance, assignment or transfer shall relieve the Tunnel Company of its obligations hereunder. And PROVIDED further that, in case the Tunnel Company or any successor or future owner of the Franchise shall be consolidated with or merged into any other corporation, the obligations of the Tunnel

Company or such successor or future owner hereunder shall remain unaffected and this franchise shall pass to such new corporation only if the agreement or act of consolidation or merger shall effectively provide that the new consolidated or merging corporation shall assume all such obligations or if such act or agreement shall not so provide, then if and when such new consolidated or merging corporation shall in writing expressly assume such obligations,—it being the express intention of this Franchise that no change in the incorporation of the Tunnel Company or of any such successor or future owner or in the ownership or control of the franchise hereby granted or of any part thereof, shall diminish or affect the obligations of the holder of the same.

XV.

If, at any time, the powers of the Board shall be transferred by law to any other board, officer or officers, then and in such case such other board, officers or officer shall have all the powers, rights and duties herein reserved to or prescribed for the Board.

In witness whereof this certificate has been prepared by the Board, be released from its obligations hereunder, unless within New York by and upon the concurrent vote of at least six of the members of the said Board, and is now attested by its seal and by the signature of its President, who is its presiding officer, and by the signature of its Secretary, this 24th day of November, 1903.

THE BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS
FOR THE CITY OF NEW YORK.
BY A. E. ORR, President.

[SEAL.] BION L. BURROWS,
Secretary.

STATE OF NEW YORK, COUNTY OF NEW YORK, SS.:

On this 28 day of November, 1903, in the City of New York, in said County, before me personally appeared Alexander E. Orr and Bion L. Burrows, each to me known and known to me to be, the said Alexander E. Orr, the President, and the said Bion L. Burrows, the Secretary, of the Board of Rapid Transit Railroad Commissioners for The City of New York; and the said Alexander E. Orr and Bion L. Burrows, being by me duly sworn, did depose and say, each for himself and not one for the other, the said Alexander E. Orr, that he resided in the Borough of Brooklyn, in the said City, that he was the President of the said Board, and that he subscribed his name to the foregoing certificate by virtue of the authority thereof; and the said Bion L. Burrows, that he resided in the Borough of Manhattan in the said City, that he was the Secretary of the said Board, and that he subscribed his name thereto by like authority; and both the said Alexander E. Orr and Bion L. Burrows that they knew the seal of the said Board and that the same was affixed to the foregoing certificate by the authority of the said Board and of a resolution duly adopted by the same, and concurred in by the vote of as many as six members of the said Board.

J. W. PORTER,
[SEAL.] Notary Public, Kings County.
Certificate filed in New York County.

The Hudson and Manhattan Railroad Company hereby accepts the foregoing franchise and all the terms, conditions and requirements thereof.

Dated New York, November 28th, 1903.

HUDSON & MANHATTAN RAILROAD COMPANY,
[SEAL.] By WILLIAM G. MCADOO, President.
ATTEST: CHARLES W. KING,
Secretary.

STATE OF NEW YORK, COUNTY OF NEW YORK, SS.:

On this 28th day of November, 1903, at the City of New York, before me personally came William G. McAdoo and Charles W. King, to me known and known to me respectively to be, the said William G. McAdoo, the President, and the said Charles W. King, the Secretary of the Hudson and Manhattan Railroad Company, and being by me duly sworn they did depose, each for himself and not one for the other, the said William G. McAdoo, that he resided at Yonkers, in the State of New York, and was the President of the Hudson and Manhattan Railroad Company, the corporation named in and which executed the forgoing consent, and that he subscribed his name to the foregoing consent by the authority of the Board of Directors thereof; and the said Charles W. King, that he resided in the Borough of Brooklyn, City of New York, in the State of New York, that he was the Secretary of the said Hudson and Manhattan Railroad Company and subscribed his name to the foregoing consent by like authority; and both the said William G. McAdoo and Charles W. King that they knew the seal of the said Hudson and Manhattan Railroad Company; that the seal affixed to such consent was such seal, and that the same was affixed to the foregoing consent by authority of the Board of Directors of the said Hudson and Manhattan Railroad Company and pursuant to a resolution adopted by the said Board.

CLARENCE J. S. DE VERE,
Notary Public, 114,
New York County.

[SEAL.]

REPORT

OF THE

CHIEF ENGINEER

NEW YORK, January 1, 1904.

ALEXANDER E. ORR, *President,*

BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS,
CITY OF NEW YORK.

Sir:—I have the honor to submit herewith a report on the work accomplished under Rapid Transit Contracts Nos. 1 and 2, and, in addition thereto, a report on the work done by the Engineering Department of your Board during the year ended December 31, 1903.

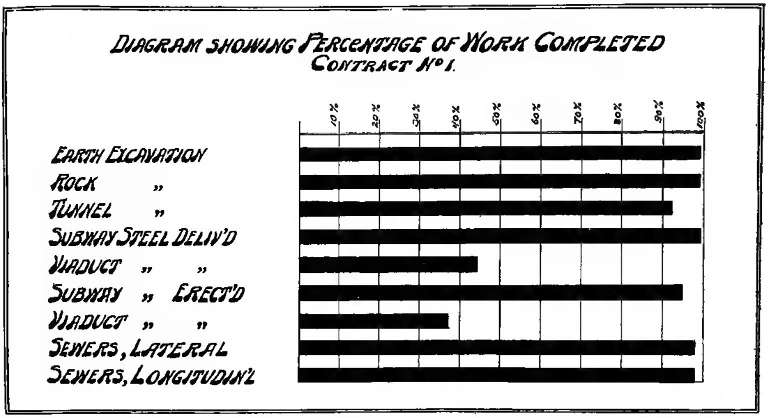
It is with pleasure that I am able to state in general that the work has proceeded during the past year steadily and satisfactorily, without preventable serious accident or interference; except so far as the work on the power house and at some other points in the subway is concerned, which has been more or less delayed by the unsettled labor conditions that prevailed during a portion of the year past throughout the United States. The total amount of work as actually vouchered during the past year was $9,695,475.86, divided as follows:

Regular work, Contract No. 1......	$6,930,000.00
Extra work, Contract No. 1.......	2,563,018.80
Regular work, Contract No. 2......	202,457.06

and the grand total of all work vouchered to date is $33,952,478.53, divided as follows:

Regular work, Contract No. 1...	$30,394,000.00
Extra work, Contract No. 1.....	3,356,021.47
Regular work, Contract No. 2......	202,457.06

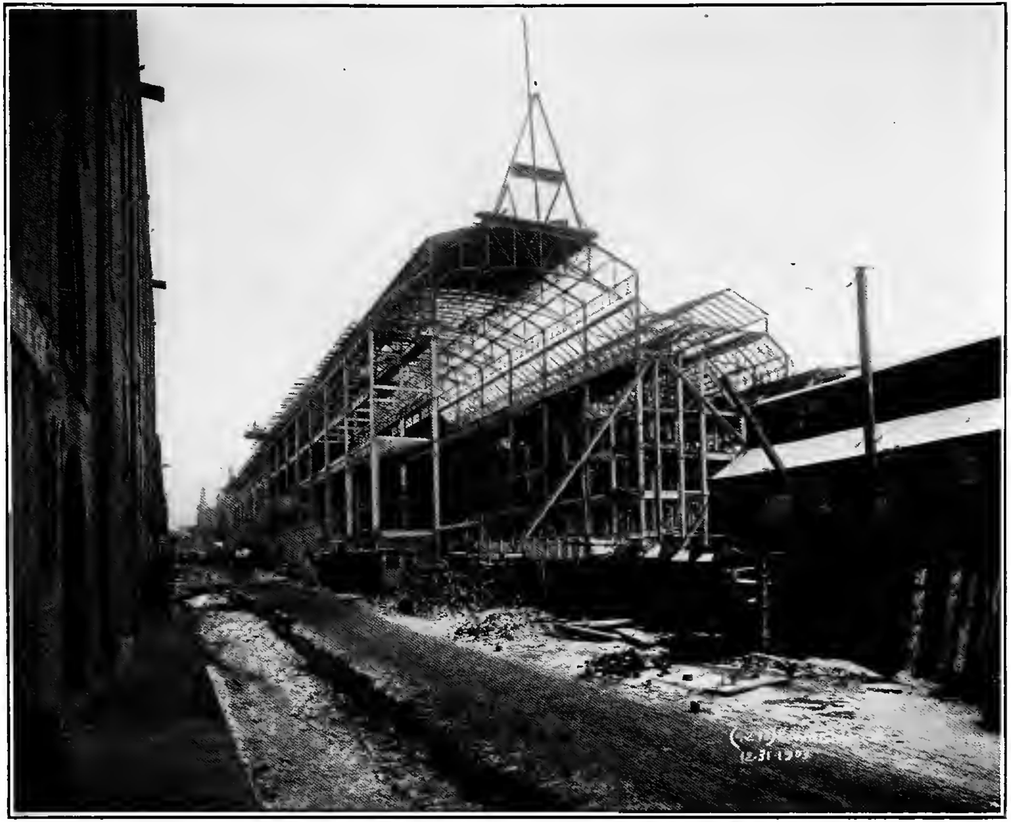
The total amount of regular work contracted for on Contract No. 1 is $35,000,000, subject, however, to certain reductions and eliminations for changes in the contract plans, so that the regular work will be somewhat less than the above-mentioned total. This indicates that about 87 per cent. of the total work on Contract No. 1 as represented in money has been completed. But inasmuch as the upper part of the viaduct portion on the west side amounting to about three miles is not covered in the vouchered total, except so far as the value of the foundations is concerned, the only field work so far done, the percentage of the work completed south of Fort George is considerably higher than the above ratio. The following diagram will show, in the total work done, the percentage completed in the principal items of construction:



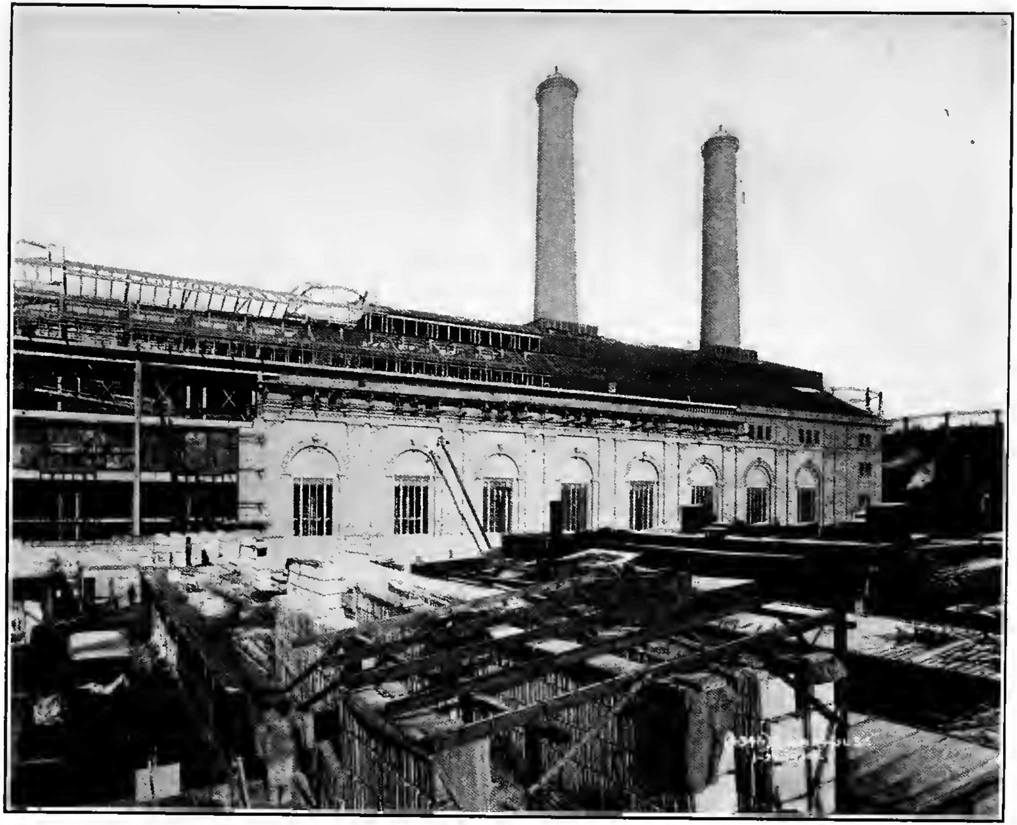
The details of the amount of work done on each section will be seen in the tables below. These tables show the work as divided under three heads, regular, extra, and outside of neat lines. The first gives the work done under, and required by the contract; the second, the work ordered by the Board to be paid for in addition to the contract; the third, all work done outside of the neat lines of construction incidental to regular or extra work, but which is not paid for as either regular or extra work, such payments being limited to neat lines.

Taking up the work in detail we find the condition in general of Contract No. 1 to be as follows:

SECTION NO. 1.—This section is substantially completed, except less than one-half of the work in connection with the Brooklyn Bridge station.



Power House, Dec. 31, 1903.



Power House, Dec. 31, 1903.

SECTION 1.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	124,640	42,974	4,050
Concrete..................	"	17,642	8,498	2,281
Other Masonry...........	"	1,178	724	744
Steel Erected..............	Tons	2,349	1,395	154
Steel Delivered...........	"	2,401	216	102

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

		OUTSIDE NEAT LINES		
Earth Excavation.........	Cu. Yds.	6,410		
Concrete..................	"	490		
Other Masonry...........	"	1,155		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	1,970	580	....
Concrete..................	"	110	38	....
Other Masonry...........	"	117	117	....
Steel Erected..............	Tons	13	6	....
Steel Delivered...........	"	13	6	....
Ducts (Single)...........	Lin. Ft.	148,680	115,432	....

SECTION NO. 2.—This section was completed except at the Worth street station and its immediate vicinity. The bricks in asphalt that have been laid in the floor and in the sidewalls as a means of waterproofing in this section, 1,626 feet of which is below tide level, has given complete satisfaction, there being no percolation of water.

SECTION 2.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds	286,830	44,710	....
Concrete.................. "	44,995	12,683	706
Other Masonry........... "	3,707	1,151	85
Steel Erected............. Tons	5,266	1,444	10
Steel Delivered........... "	5,276	....	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	17,550		
Concrete.................. "	1,234		
Other Masonry........... "	2,390		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	12,020	1,060	....
Concrete.................. "	2,065	738	....
Other Masonry........... "	222	222	....
Steel Erected............. Tons	418	45	....
Steel Delivered........... "	418	347	....
Ducts (Single)........... Lin. Ft.	723,093	180,569	....

SECTION No. 3.—This section at the close of the year was almost completed; the only work remaining being a small amount in connection with the station at Astor place, a delay in the beginning of which had been necessitated owing to the change in the lines of Fourth avenue.

SECTION 3.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	340,654	14,937	....
Rock " .... "	99,611	3,861	....
Concrete.................. "	62,083	12,917	576
Other Masonry........... "	5,336	1,378	....
Steel Erected............. Tons	7,539	1,654	24
Steel Delivered........... "	7,563	201	....

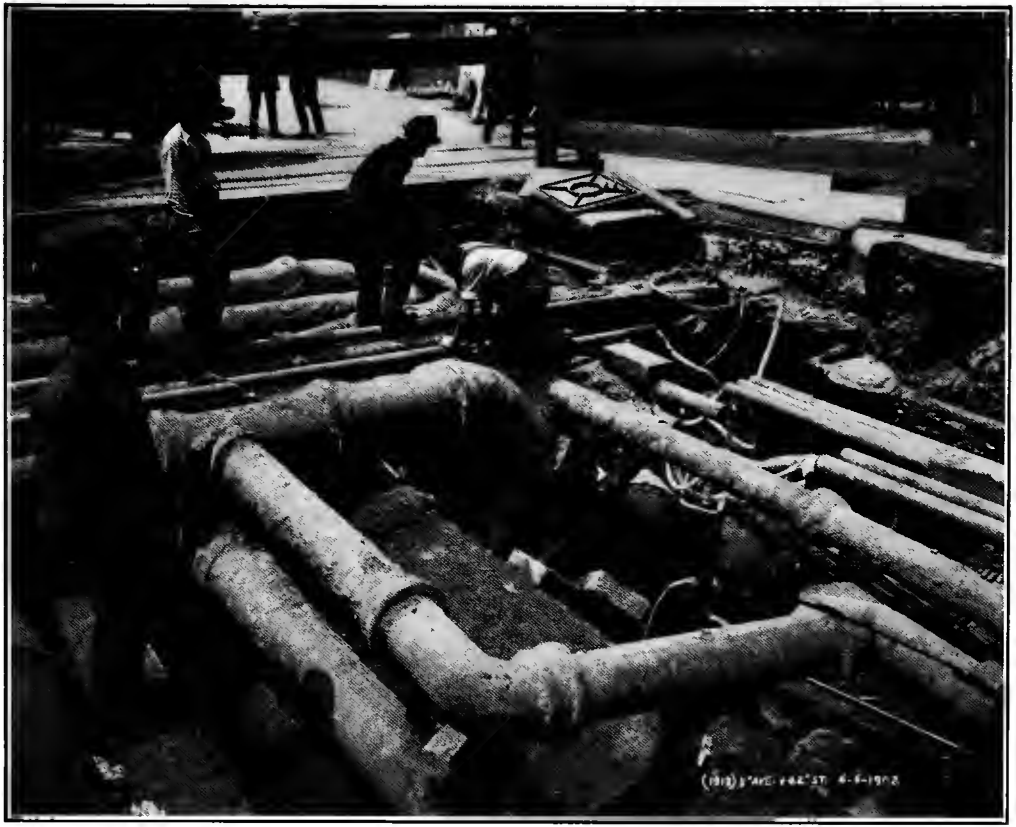
EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

		OUTSIDE NEAT LINES		
Earth Excavation	Cu. Yds.	11,408		
Rock "	"	3,952		
Concrete	"	2,052		
Other Masonry	"	10,704		

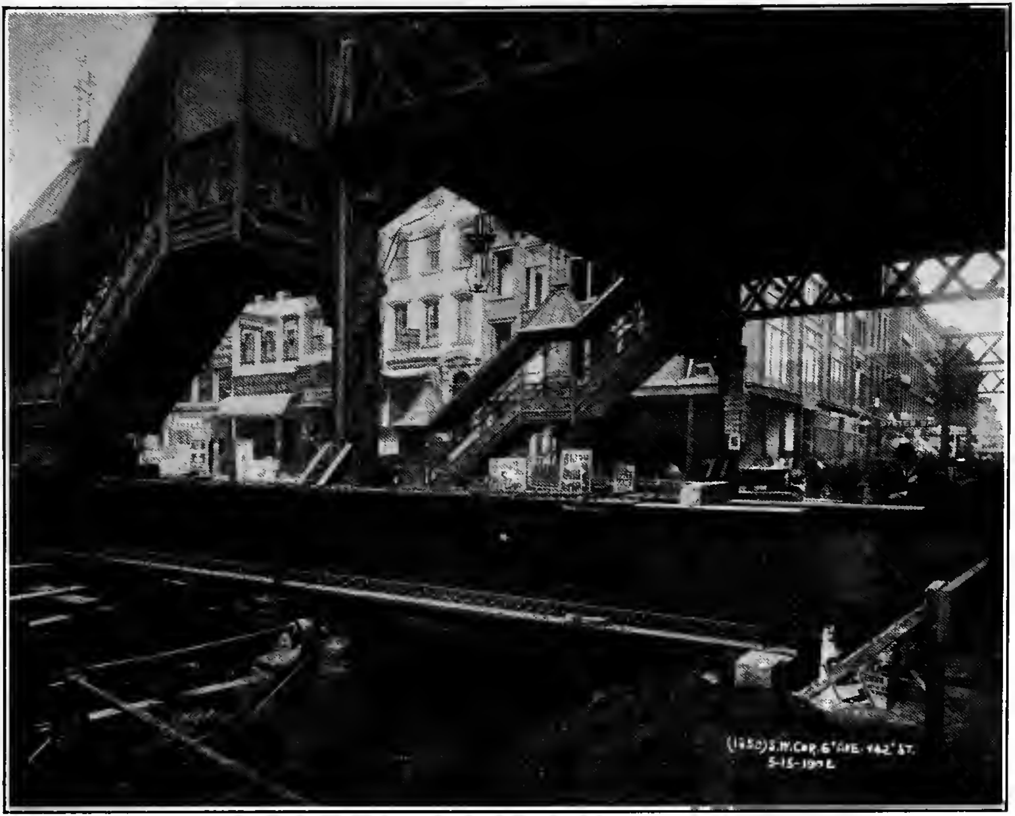
EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation	Cu. Yds.	12,350	1,628	....
Rock "	"	3,414	....	....
Concrete	"	2,788	601	....
Other Masonry	"	235	217	....
Steel Erected	Tons	278	157	....
Steel Delivered	"	278	236	....
Ducts (Single)	Lin. Ft.	976,386	203,967	....

SECTION No. 4.—This section was completed early in the autumn. In order to drain by a single plant the twin tunnels comprising this section, a cross drift lined with concrete was constructed between Thirty-seventh and Thirty-eighth streets. This drift has a length of 43 feet, a clear height of 7 feet and a clear width of 5 feet. In it are installed duplicate pneumatic



Re-Arranging Pipes at Forty-Second Street and Fifth Avenue.



ELEVATED RAILROAD COLUMNS BEING SUPPORTED DURING CONSTRUCTION OF SUBWAY IMMEDIATELY UNDERNEATH.

pumps delivering through 890 feet of five-inch pipe into the sewer at Forty-first street. As this cross drift is at practically the lowest point on the section, a well sunk in the bottom of the drift acts as a sump, to which the main drains of both tunnels are led. In order to relieve the tunnel linings from hydrostatic pressure, drains are placed outside of the masonry lining, which lead into a central drain in each tunnel, these drains in turn being led to the sump.

SECTION 4.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	1,141	....	....
Rock " .... "	6,252	32	....
Tunneling................. "	69,015	2,227	....
Concrete.................. "	28,932	5,048	....
Steel Erected............. Tons	34	10	....

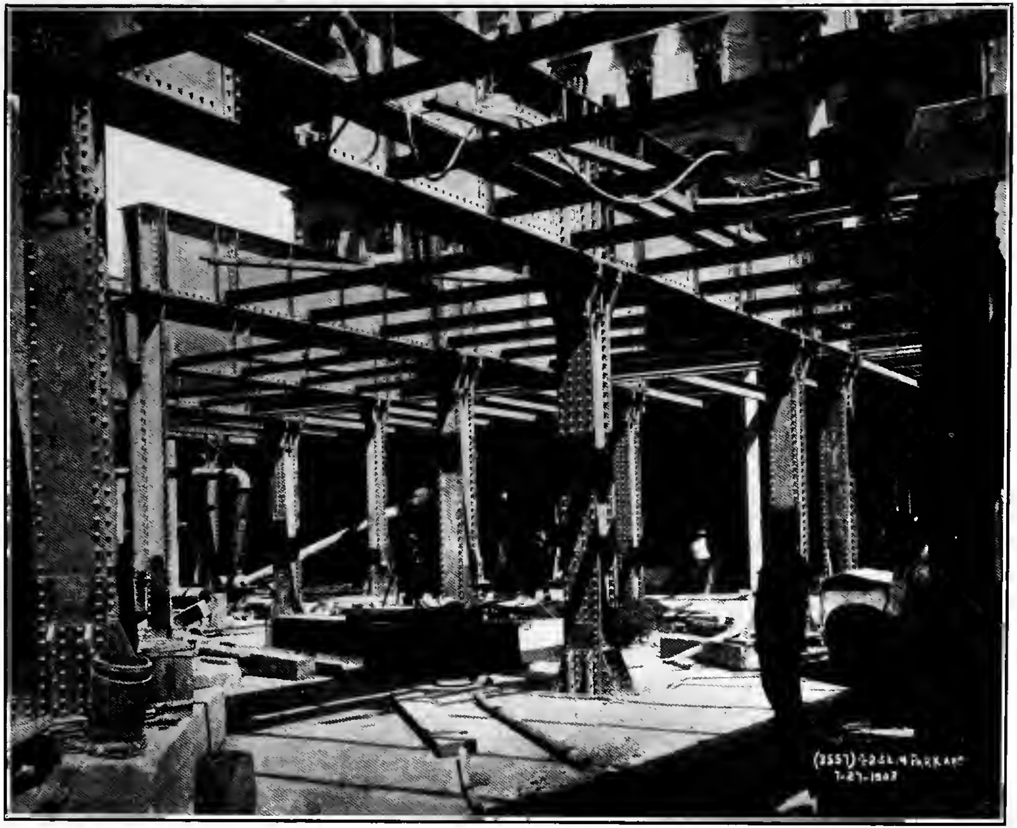
EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Tunneling.................Cu. Yds.	3,348		
Other Masonry........... "	929		

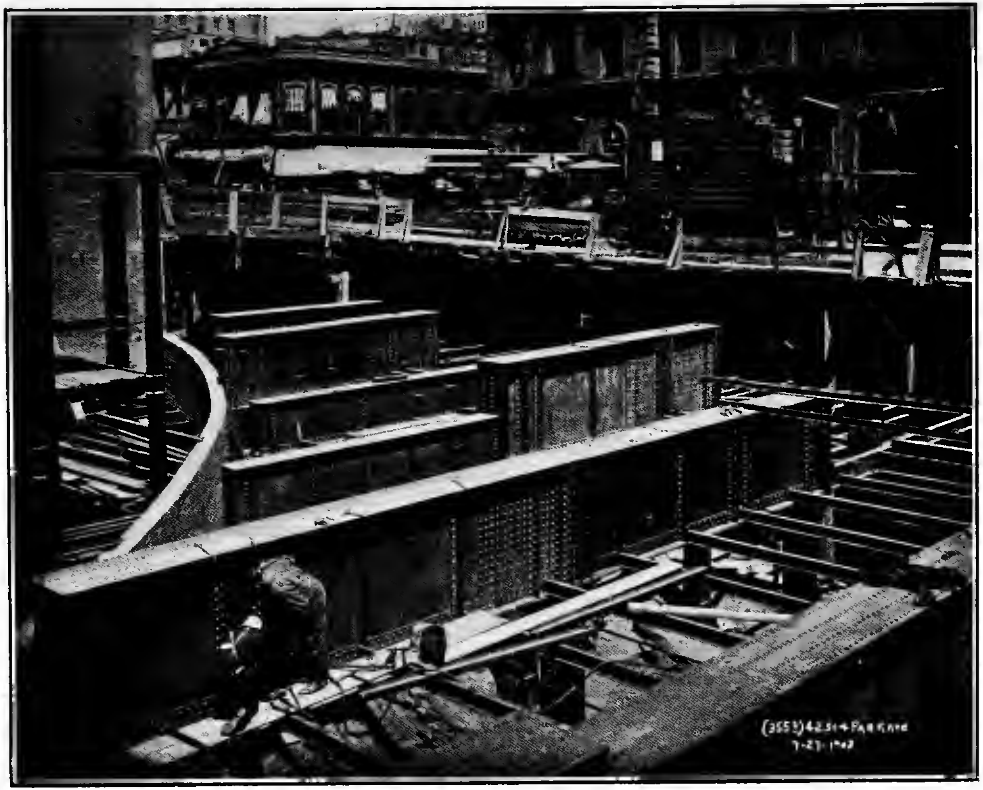
EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Rock Excavation......	Cu. Yds.	62	20	....
Tunneling..................	"	1,225	371	....
Concrete...................	"	491	223	....
Steel Erected..............	Tons	47	47	....
Steel Delivered............	"	52	52	....
Ducts (Single)............	Lin. Ft.	122,006	55,702	....

SECTION NO. 5-A.—This section consisting chiefly of the work under Forty-second street, was a work of considerable magnitude. The subway beneath Forty-second street had been completed, likewise the subway north of Forty-third street. A large express station at Park avenue in connection with the Grand Central Station of the New York Central Railroad was still in hand, likewise a station between Forty-second and Forty-third streets on Broadway. It was hoped that the surface of the streets at these points and on Forty-second street would have been restored before the end of the year, but owing to the severity of the winter the ground became deeply frozen, so that it was necessary to suspend all work on the surface until spring. At the east end of this section the subway passes beneath the Hotel Belmont, a structure of twenty-two stories, and, at Broadway, through the building of the New York Times. Details of this work were described in the last report, and it is a pleasure to be able to state that these two difficult pieces of construction have been successfully completed. The work in connection with the New York Times Building was more intricate than that at the Hotel Belmont; as in the former case the press rooms of the newspaper, with a clear height of 19½ feet, extended beneath the tracks of the subway, and a building of twenty-three stories



COLUMNS AND GIRDERS TO SUPPORT THE HOTEL BELMONT OVER THE SUBWAY.



Girders over Subway to support Hotel Belmont.

reached above the subway. It was expressly desirable that the running of trains in the subway should not affect the printing presses or the building by vibration, and it was decided that the structure of the building and the structure of the subway should be wholly separate. A photograph hereto attached illustrates how this was accomplished. At the north-east corner of Forty-second street and Broadway where the subway passes under private property, a small building standing on the corner was taken down and replaced during the year.

SECTION 5A.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	159,410	29,866	....
Rock " .... "	118,252	22,768	....
Concrete.................. "	33,203	15,032	3,952
Other Masonry........... "	2,129	905	557
Steel Erected............. Tons	4,039	1,887	474
Steel Delivered........... "	4,530	299	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	4,377		
Rock " .... "	3,471		
Other Masonry........... "	247		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

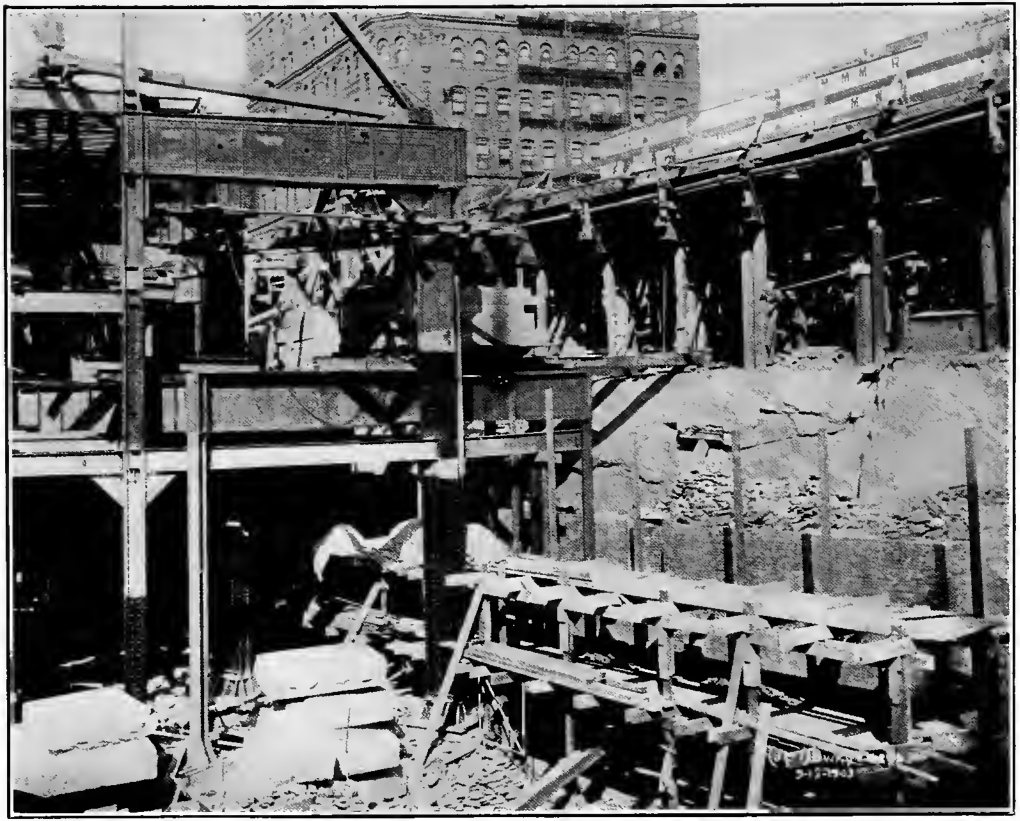
	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	5,472	590	....
Rock " .... "	4,444	936	....
Concrete.................. "	1,112	571	110
Other Masonry........... "	46	40	12
Steel Erected............. Tons	151	130	12
Steel Delivered........... "	158	123	....
Ducts (Single)...........Lin. Ft.	495,446	204,074	34,602

SECTION NO. 5-B.—This section had been entirely completed early in the year 1903.

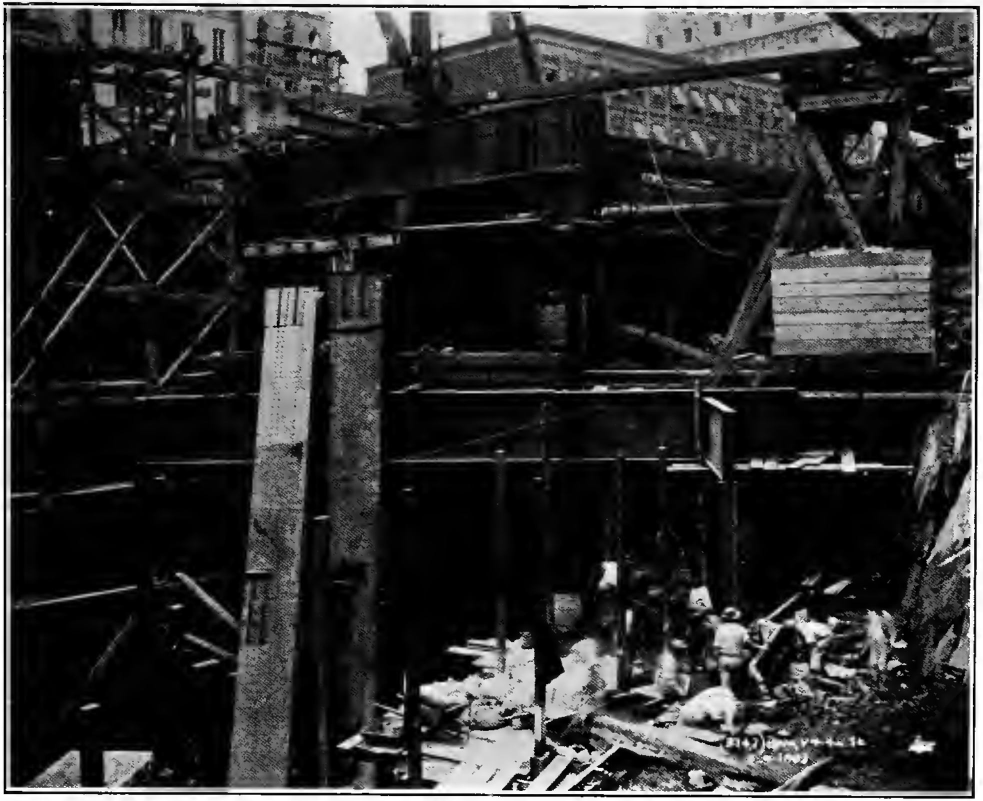
SECTION 5B.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	100,585	2,240	....
Rock " .... "	87,605	975	....
Concrete.................. "	26,059	1,248	....
Other Masonry........... "	2,273	154	....
Steel Erected............. Tons	2,869	175	....
Steel Delivered........... "	2,872	8	....



Times Building, Forty-Second Street and Broadway.
Columns extending through the Subway and basement and Girders to support the Building over the Subway.



View showing Subway over the Times Basement and Steelwork to support the Times Building over the Subway.

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	2,451		
Rock " .... "	3,681		
Other Masonry........... "	2,256		

EXTRA WORK, DUCTS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	2,532	2	....
Rock " .... "	2,585	85	....
Concrete.................. "	1,008	192	....
Other Masonry........... "	75	....	....
Steel Erected............. Tons	28	2	....
Steel Delivered........... "	30	1	....
Ducts (Single)...........Lin. Ft.	451,524	19,998	....

Section No. 6-A.—This section was completed except some work at the Seventy-second street station, chiefly, however, on the surface, and a small amount of surface restoration between Seventy-seventh and Seventy-eighth streets. The surface of the street at both these points would have been entirely restored had it not been for the early winter weather.

SECTION 6A.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	146,469	15,397	....
Rock "	"	147,780	17,993	....
Concrete..................	"	41,557	16,616	....
Other Masonry...........	"	3,151	1,066	....
Steel Erected..............	Tons	4,773	1,951	255
Steel Delivered...........	"	5,028	16	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

		OUTSIDE NEAT LINES		
Earth Excavation.........	Cu. Yds.	10,050		
Rock "	"	7,113		
Other Masonry...........	"	497		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	8,006	686	....
Rock "	"	9,170	1,004	...
Concrete..................	"	2,757	1,576	...
Other Masonry............	"	84	33	....
Steel Erected..............	Tons	162	78	....
Steel Delivered............	"	169	17	..
Ducts (Single)............	Lin. Ft.	787,365	322,887	....

Section No. 6-B.—This section progressed more slowly than the other sections during the year, and at the close the express station at Ninety-sixth street and the junction between the east and west side lines at One Hundred and Third street still remained uncompleted.

SECTION 6B.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	167,990	6,194	....
Rock "	"	136,028	36,639	14
Concrete..................	"	40,563	15,911	2,354
Other Masonry............	"	3,049	1,383	618
Steel Erected..............	Tons	5,026	2,364	553
Steel Delivered...........	"	5,579	....	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	15,739		
Rock " .... "	13,389		
Concrete.................. "	75		
Other Masonry............ "	220		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	11,201	3,265	1,126
Rock " .... "	17,157	7,549	361
Concrete.................. "	6,061	4,876	738
Other Masonry............ "	54	36	11
Steel Erected.............. Tons	436	398	58
Steel Delivered............ "	491	453	....
Ducts (Single)............Lin. Ft.	659,539	261,469	50,701

Section No. 7.—The excavation on this section, consisting chiefly of the tunnel beneath One Hundred and Fourth street and Central Park, had been completed, and 99 per cent. of the lining had been put in place. The roof of the tunnel at the shaft near Broadway was being closed in. The designs for the shaft at Central Park West make this shaft a permanent structure with a stairway to be used for access in emergency cases, and to be equipped, if necessary, with a fan for ventilating purposes.

SECTION 7.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	8,627	....	....
Rock "	"	3,759	....	....
Tunneling.................	"	74,389	17,955	....
Concrete..................	"	14,465	7,938	....
Other Masonry............	"	1,074	752	....
Steel Erected..............	Tons	171	....	....
Steel Delivered...........	"	171	....	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

		OUTSIDE NEAT LINES		
Earth Excavation.........	Cu. Yds.	368		
Rock "	"	207		
Tunneling.................	"	14,500		
Concrete..................	"	8,500		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds	238	....	....
Rock " .... "	409	136	....
Tunneling................. "	334	234	....
Concrete.................. "	197	87	....
Steel Erected.............. Tons	11	6	....
Steel Delivered............ "	11	11	....
Ducts (Single)............Lin. Ft.	249,510	139,216	....

Section No. 8.—On this section the stations at One Hundred and Sixteenth and One Hundred and Twenty-fifth streets still remain to be finished.

SECTION 8.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	158,299	14,684	1,101
Rock " .... "	130	88	....
Concrete.................. "	29,540	4,235	3,790
Other Masonry............ "	2,648	341	108
Steel Erected.............. Tons	2,594	572	227
Steel Delivered............ "	2,821	....	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	4,709		
Concrete.................. "	3,082		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	10,058	3,803	49
Concrete.................. "	2,653	1,300	92
Other Masonry........... "	40	16	....
Steel Erected.............. Tons	170	89	....
Steel Delivered............ "	170	77	....
Ducts (Single)...........Lin. Ft.	398,237	38,240	19,299

SECTION No. 9-A.—This section consists of the Harlem river tunnel and its approaches from One Hundred and Thirty-fifth street on the south and from Girard avenue on the north. The south approach had been constructed, as described in the last report, chiefly of reinforced concrete. Our experience in this method of construction has been entirely satisfactory. In regard to the work on the Harlem river section, the westerly half was completed; the easterly half is in hand and with every promise of being completed in the early part of the coming year. The method pursued by the sub-contractor, as described in the last report, has proved successful.

SECTION 9A.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	131,773	35,352	2,116
Rock " .... "	15,497	1,990	....
Concrete.................. "	31,184	15,412	2,671
Other Masonry........... "	956	49	....
Steel Erected.............. Tons	1,098	107	....
Steel Delivered........... "	1,086	7	12

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	34,815		
Rock " .... "	510		
Concrete.................. "	2,146		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	2,217	....	45
Rock "	"	340	....	....
Concrete..................	"	688	106	65
Other Masonry............	"	3	....	....
Steel Erected..............	Tons	44	27	48
Steel Delivered............	"	44	27	48
Ducts (Single)............	Lin. Ft.	123,458	19,882	32,592

EXTRA WORK, LENOX AVENUE EXTENSION.

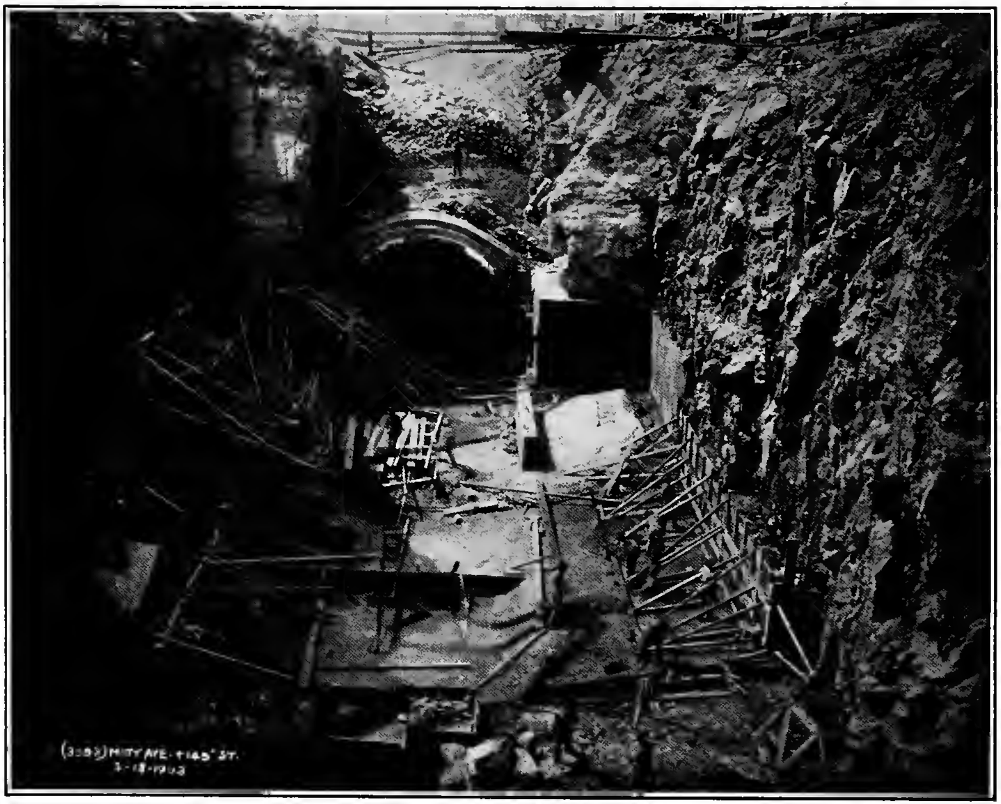
		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	40,770	40,770	....
Rock "	"	1,723	1,723	23
Concrete..................	"	5,983	5,983	7,959
Other Masonry............	"	7	7	....
Steel Erected..............	Tons	270	270	539
Steel Delivered............	"	636	636	173
Ducts (Single)............	Lin. Ft.	14,776	14,776	20,208

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

(LENOX AVENUE EXTENSION.)

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	3,427		
Concrete.................. "	727		

SECTION NO. 9-B.—This section, the last of the subway sections prior to the beginning of the east side viaduct, was finished except the Mott avenue station, a small amount of work in connection with the station at Third avenue, and the crossing under the New York Central Railroad tracks at Railroad avenue. It had been originally contemplated that the Mott avenue station should be constructed by tunnel. The ground, however, was found to be so difficult for tunneling operations, consisting as it did of a mixture of hard rock, rotten rock and sand, that it was decided to construct the station in open cut. As the material composing the ground was of the uncertain character described above, it was necessary to construct the side walls of heavy masonry. The cut, therefore, was 60 feet deep, with a width of 63 feet at the bottom and from 60 to 120 feet at the top. The total length of this station is 350 feet. This is the largest piece of excavation of equal length on the whole subway, involving the removal of 52,900 cubic yards.



Excavation for Station at Mott Avenue.

SECTION 9B.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	105,027	19,762	3,785
Rock " .... "	57,410	16,773	....
Tunneling................. "	545	....	...
Concrete.................. "	26,194	12,825	6,199
Other Masonry............ "	1,287	505	136
Steel Erected.............. Tons	746	382	110
Steel Delivered........... "	856	371	....

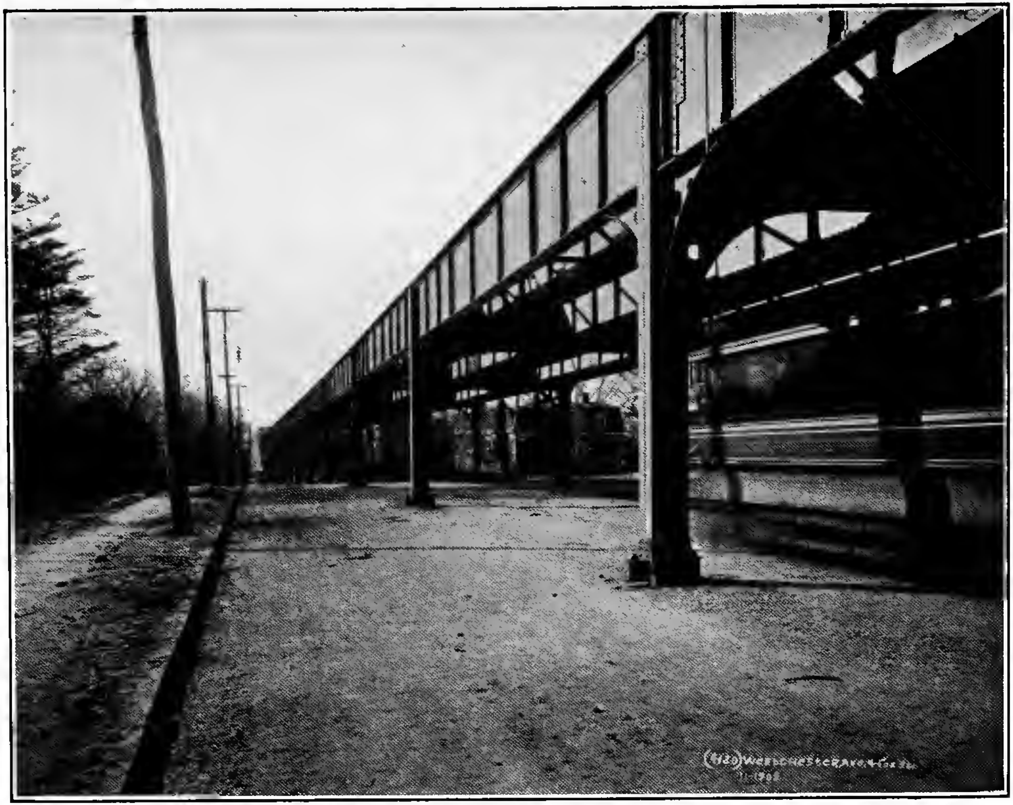
EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	11,953		
Rock " .... "	7,720		
Concrete.................. "	3,859		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	4,592	4,592	90
Rock " .... "	6,458	6,458	....
Concrete.................. "	2,441	2,441	347
Other Masonry............ "	19	19	....
Steel Erected.............. Tons	70	70	27
Steel Delivered............ "	82	82	15
Ducts (Single)............Lin. Ft.	38,272	38,272	113,280

Section No. 10.—For this section, the east side viaduct, the contract drawings contemplated a route from One Hundred and Forty-ninth street through Third avenue to Westchester avenue as a part of Section 9-B, and then the beginning of the viaduct on Westchester avenue. After consideration it was decided to avoid the damage to Westchester avenue that would follow the open cut and raised embankment necessary by the change from subway to viaduct, and to do this a route was laid out extending the subway across Third avenue and thence under private property between One Hundred and Forty-ninth street and Westchester avenue, the change from subway to viaduct taking place in the block above described, so that no street would be interfered with. This matter was acted on favorably by the Board of Aldermen on November 11, 1902, and approved by the Mayor, November 17, 1902, and was finally approved by the Courts on behalf of the property owners, and the necessary consents of the property owners were acquired in the early part of 1903. A Commission for condemning the value of the easement was appointed by the Supreme Court on July 2. All of the foundations for the viaduct from Brook and Westchester avenues to Bronx Park had been put in, and the erection of



Standard Elevated Structure.

the steel viaduct along Westchester avenue, the Southern boulevard and the Boston road was begun during the year, and at the close of the year was finished for a distance of 7,200 feet out of a total of 16,000 feet. This structure is of steel, with three tracks supported by two rows of columns spaced 29 feet apart, so as to clear by a good margin the cars of the surface electric railway. The span between the columns varies from 40 feet to 87 feet, but is usually about 50 feet. The longitudinal members are plate girders. The structure has been designed to carry as a live load motor cars with a length of 46 feet, and weighing 100,000 lbs. These requirements are in excess of the requirements previously imposed for similar structures. In addition a special effort has been made to give the whole structure and its component parts great stiffness and rigidity. To this end the structure has been thoroughly cross-braced, and deep knee braces have been introduced between the columns and cross girders and between the columns and outside longitudinal girders. To increase the lateral stiffness the main angles of the columns are riveted to the web of the cross girder, which web is extended downward to form the web of the knee brace.

SECTION 10.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation..........	Cu. Yds.	8,589	....	....
Rock "	"	751	....	....
Concrete..................	"	3,977	....	....
Other Masonry............	"	323	....	....
Steel Erected..............	Tons	4,656	4,651	5,641
Steel Delivered............	"	5,860	5,833	4,464

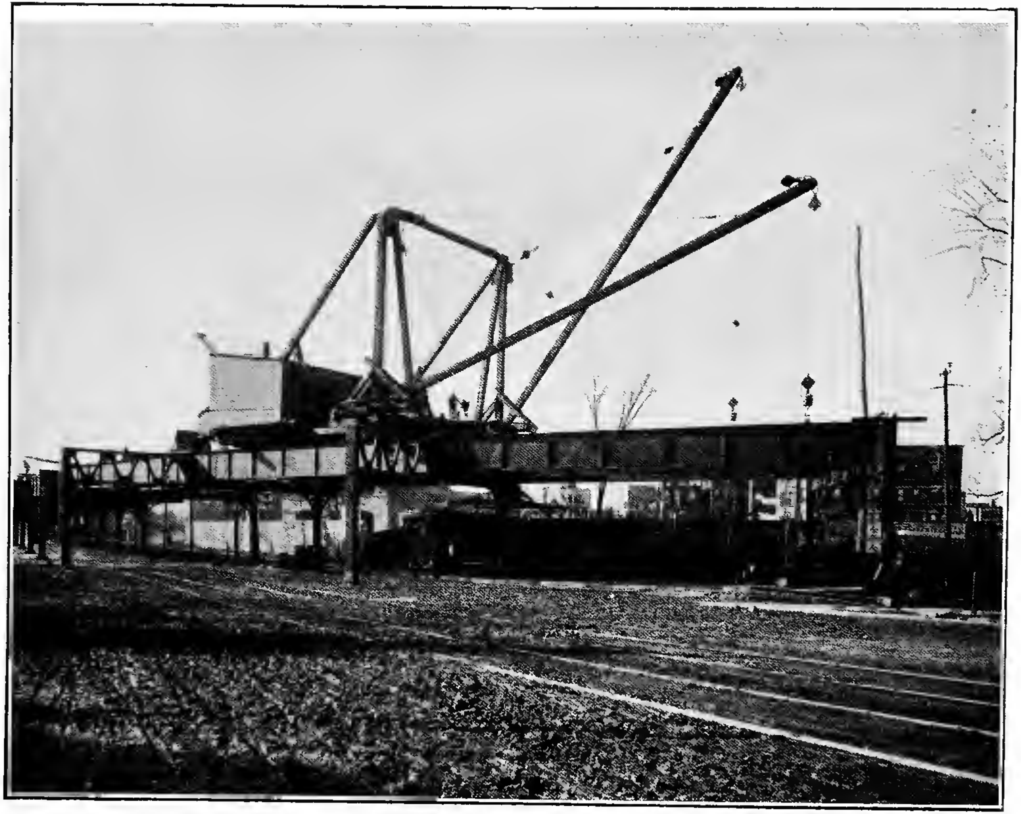
EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	698		
Rock " .... "	286		
Concrete.................. "	212		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	3,927	3,927	1,025
Rock " .... "	442	442	....
Concrete.................. "	937	937	520
Steel Erected.... .... Tons	1,622	1,622	2,811
Steel Delivered............ "	2,064	2,064	2,369
Ducts (Single)............ Lin. Ft.	234,965	234,965	....

Section No. 11.—Work on this section was completed during the year, the only part remaining to be done being a certain amount of backfilling and the restoration of the street surface, which, as in other cases, was prevented from being accomplished by the severe cold.



Traveler erecting Elevated Structure.

SECTION 11.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	62,050	2,148	....
Rock "	"	87,274	12,866	....
Concrete..................	"	23,093	9,190	....
Other Masonry...........	"	2,601	1,437	67
Steel Erected.............	Tons	1,529	740	19
Steel Delivered...........	"	1,570	....	....

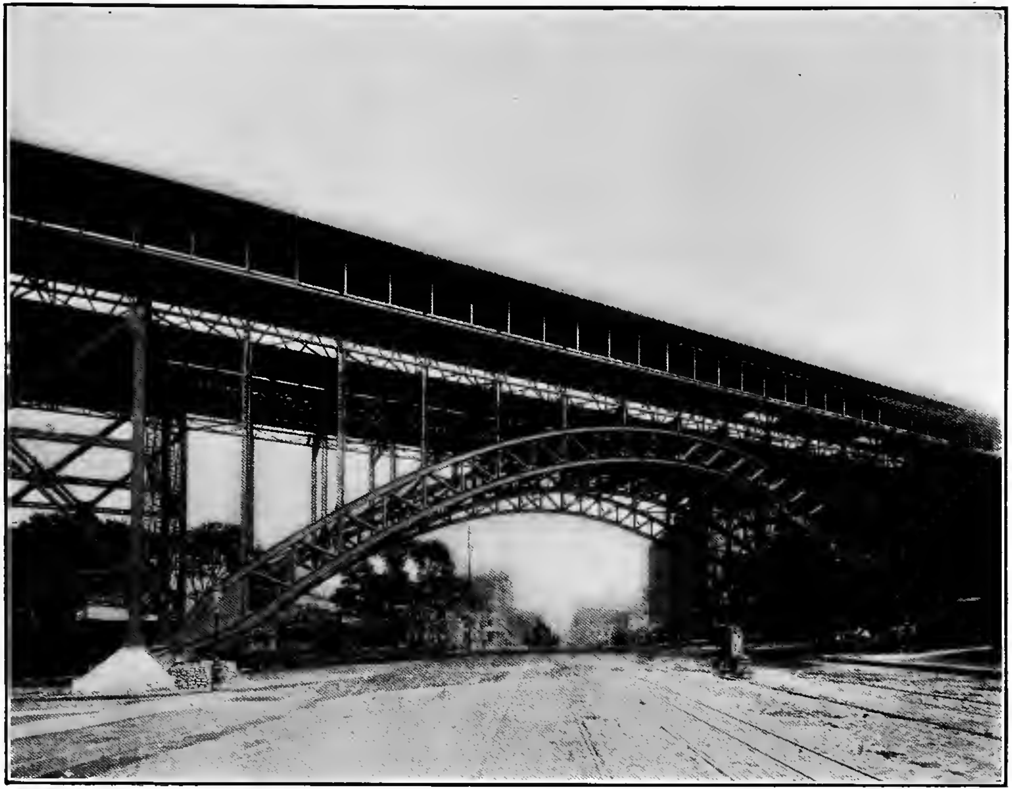
EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

		OUTSIDE NEAT LINES		
Earth Excavation.........	Cu. Yds.	5,147		
Rock "	"	9,128		
Concrete..................	"	4,845		
Other Masonry...........	"	2,382		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	29,080	3,504	....
Rock " .... "	37,887	6,661	....
Concrete.................. "	9,065	4,421	....
Other Masonry........... "	284	133	....
Steel Erected............. Tons	1,263	588	45
Steel Delivered........... "	1,307	6	....
Ducts (Single)............ Lin. Ft.	276,044	204,656	....

Section No. 12.—This section, being the Manhattan Valley viaduct, was completed during the year. The total length from the portal at One Hundred and Twenty-second street to the portal at One Hundred and Thirty-fifth street is 3,353 feet, of which 1,179 feet are on the masonry approaches, either in open cut or on embankment between walls, and 2,174 feet on steel viaduct. The last constitutes Section 12. The height of the structure from ground to rail level varies from 13½ feet of 55½ feet. Where the structure is low a construction of ordinary bents carrying the longitudinal girders has been followed. Where the height of structure exceeds 31 feet, braced towers have been introduced, the tower spans being 26.6 feet long, and the intermediate spans 49 to 72 feet. At Manhattan street an arch was constructed in order to avoid any interference with the intricate surface railway junction. This arch is of the two-hinged type, and has a span of 168½ feet between centres of pins.



Manhattan Valley Arch, 170 Ft. Span.

SECTION 12.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	3,759	....	....
Rock "	"	149	....	....
Concrete..................	"	2,565	....	....
Other Masonry...........	"	297	49	....
Steel Erected..............	Tons	2,010	333	....
Steel Delivered...........	"	2,010	181	....

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

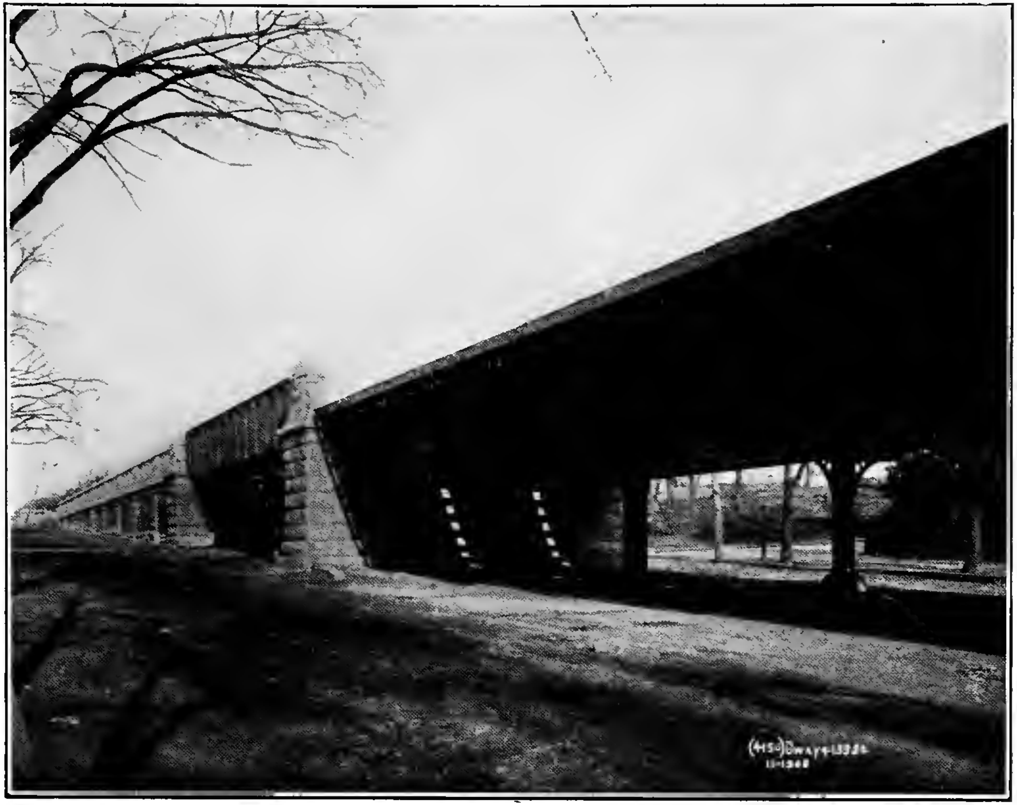
		OUTSIDE NEAT LINES		
Earth Excavation.........	Cu. Yds.	1,071		
Rock "	"	11		
Concrete..................	"	22		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	1,422	....	....
Rock " .... "	89	....	....
Concrete.................. "	459	....	.
Other Masonry........... "	34	24	...
Steel Erected.............. Tons	561	56	.. .
Steel Delivered........... "	561	561	....
Ducts (Single)............Lin. Ft.	68,327	5,863	....

SECTIONS NOS. 13 and 14.—These two sections cover the work from One Hundred and Thirty-third street to the north end of the Fort George tunnel. On Section 13 there still remain to be completed a portion of the storage yard between One Hundred and Thirty-seventh and One Hundred and Forty-fifth streets, and the stations at One Hundred and Forty-fifth and One Hundred and Fifty-seventh streets. A portion of the Fort George tunnel on Section 13 had been completed so far as the excavation of the tunnel proper was concerned, and the work of lining was well advanced. Plans have been adopted during the year for the stations at One Hundred and Sixty-eighth and One Hundred and Eighty-first streets, and the excavation for the former had been begun. These stations require an arch with a clear span of 48 feet and with a length of 300 feet, involving a tunnel excavation of 53 feet in width and 30½ feet in height in the clear. Fortunately, at both One Hundred and Sixty-eighth and One Hundred and Eighty-first streets the rock was sound, permitting these large tunnel excavations to be carried out.

The north end portion of the Fort George tunnel, comprising Section 14, was uncompleted, the heading between the One



Approach to Manhattan Valley Viaduct.

Hundred and Eighty-first street shaft and the Fort George portal not having met. The rock at the north end of Fort George unfortunately proved to be of very bad character, with broken and undeterminable seams and fissures. At the suggestion of the Chief Engineer the Contractor decided to abandon the driving of the heading south from Fort George, relying on the completion of the tunnel headings by an advance northward from One Hundred and Eighty-first street, and concentrated the whole of the work at the north end on the reremoval of the bench and the completing of the permanent timbering and permanent masonry lining as rapidly as the removal of the bench would permit. In spite of all these precautions it is regretted that an accident occurred on October 24, when a mass of rock fell from the roof, crushing the temporary timbering and killing ten men. A careful and thorough investigation was made by the Coroner, who entirely exonerated the Contractor from any blame, it having been decided that all possible precautions had been taken by him.

SECTION 13.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

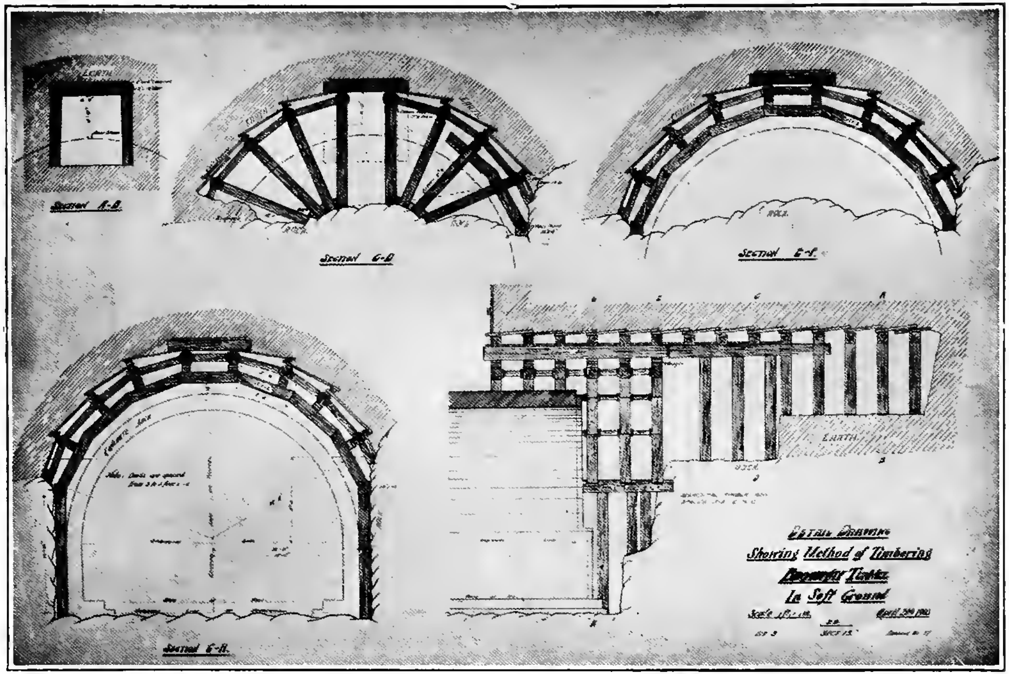
		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	98,376	11,087	750
Rock "	"	51,914	3,325	1,305
Tunneling.................	"	132,001	15,768	10,627
Concrete..................	"	41,103	17,023	12,097
Other Masonry...........	"	1,828	656	1,879
Steel Erected.............	Tons	1,408	565	313
Steel Delivered...........	"	1,719	156	2

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Earth Excavation.........Cu. Yds.	14,113		
Rock " .... "	5,769		
Tunneling................. "	20,810		
Concrete.................. "	9,657		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	14,586	4,495	2,083
Rock " .... "	3,473	676	45
Tunneling................. "	2,356	439	2,252
Concrete.................. "	3,474	1,160	1,076
Other Masonry........... "	85	62	....
Steel Erected............. Tons	219	85	6
Steel Delivered........... "	225	18	....
Ducts (Single)........... Lin. Ft.	290,132	118,598	121,164


EARTH
SECTION A-B
EARTH
SECTION C-D
ROCK
SECTION E-F
SECTION G-H
EARTH
DETAIL DRAWING
Showing Method of Timbering
In Soft Ground
April 1901

SECTION 14.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	1,754	....	200
Rock “ .... “	4,389	....	508
Tunneling................ “	59,327	25,201	17,499
Concrete.................. “	3,054	1,702	16,812
Other Masonry........... “	....	....	

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

	OUTSIDE NEAT LINES		
Tunneling................Cu. Yds.	7,015		
Concrete.................. “	687		

EXTRA WORK, LENGTHENING STATION PLATFORMS, DUCTS, ETC.

	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........Cu. Yds.	2,108	2,108	533
Rock “ .... “	552	552	....
Tunneling................ “	216	....	398
Concrete.................. “	575	575	82
Other Masonry........... “	....	....	63
Ducts (Single)...........Lin. Ft.	132,448	132,448	19,200

SECTION NO. 15.—This is the portion of the viaduct on the northerly end of the west side line. Foundations have been put in from Fort George northerly to the Harlem river ship canal. During the year plans were being made for the reconstruction of the bridge span across the ship canal so as to accommodate not only the street traffic as at present, but also the rapid transit railway and the cars of the surface railway, with a sub-surface electric conduit. It was not until the close of the year that the details of this bridge had been decided, when the season was too far advanced to begin the construction of the foundations for the remaining portion of the viaduct north of the ship canal. The details of the viaduct on Section 15 are similar to those already described on Section 10.

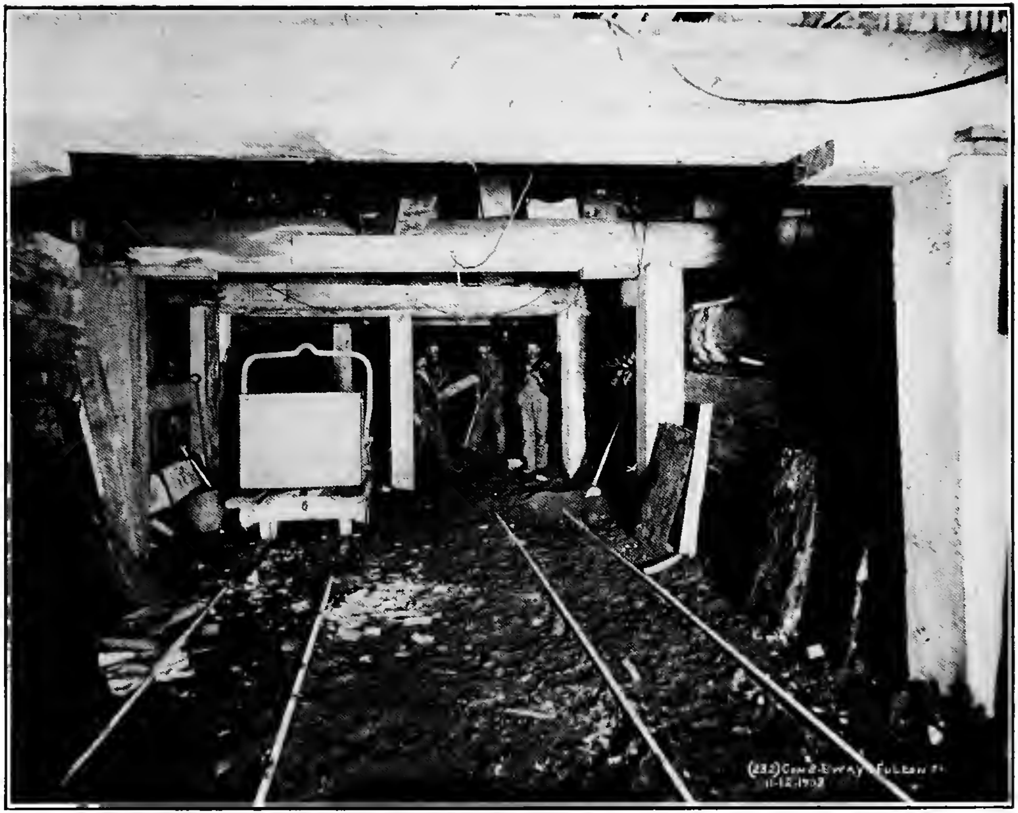
SECTION 15.

QUANTITIES OF WORK UNDER CONTRACT PLANS.

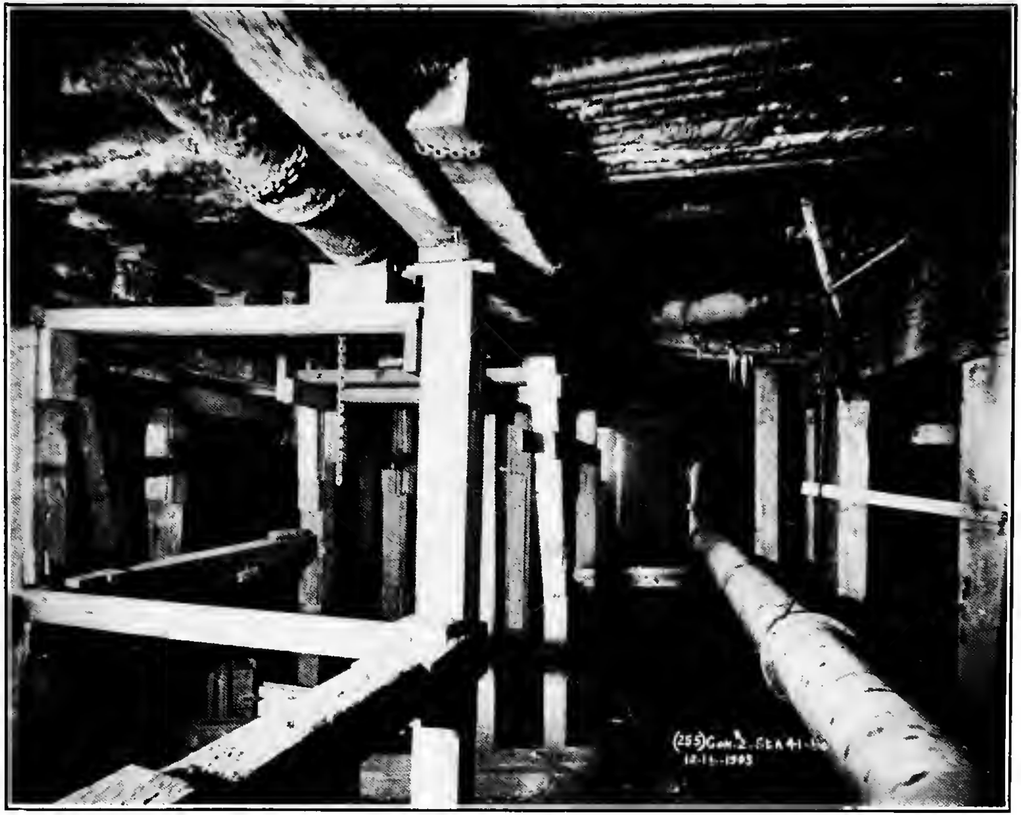
		TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation.........	Cu. Yds.	6,200	6,200	3,740
Rock "	"	300	300	....
Concrete..................	"	2,417	2,417	1,520
Other Masonry............	"	111	111	59
Steel Erected..............	Tons	9	9	5,630
Steel Delivered...........	"	....	....	5,630

EXCESS QUANTITIES. TOTAL TO DECEMBER 31, 1903.

		OUTSIDE NEAT LINES		
Earth Excavation.........	Cu. Yds.	139		
Rock "	"	75		
Concrete..................	"	48		



Excavation and Timbering at Broadway and Fulton Street.



Excavation and Timbering at Broadway and Fulton Street.

EXTRA WORK—TERMINALS

	LENOX AVE. TERMINAL			BROADWAY TERMINAL		
ITEM	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE	TOTAL TO DEC. 31, 1903	TOTAL DURING 1903	AMOUNT TO BE DONE
Earth Excavation, Cu. Yds.	....	....	....	78,355	35,197	4,615
Rock Excavation.. "	....	....	....	9,831	4,986	1,017
Concrete.............. "	320	320	20	12,454	7,584	1,005
Other Masonry..... "	....	....	18	236	124	45
Steel Erected....... Tons	....	....	....	1,479	863	328
Steel Delivered..... "	....	....	....	1,807	24	....
Ducts (Single).....Lin.Ft.	1,920	1,920	....	....	....	....

Summarizing the above results, practically all of the excavation except a small amount in connection with the Brooklyn Bridge station had been completed south of Sections 8 on the east side line and 13 on the west side line. The only excavation of considerable moment to be removed was in connection with the yard on Section 13 and the completion of the tunnel on Section 14. Speaking approximately, 99 per cent. of the total excavation on the whole of the work had been completed.

With the exception of the points above noted, where the work was still incomplete, the work remaining to be done consisted entirely of structure erection.

In addition to the quantities of work represented in the foregoing tables, being the principal items of construction, the following tables give the quantities under all heads, both as to contract and extra work, during the year 1903, and the total at the end of the years 1900, 1901, 1902 and 1903, separately.

TOTAL AMOUNT OF CONTRACT WORK DON

ITEMS	Quantity	Sec. 1	Sec. 2	Sec. 3	Sec. 4	Sec. 5-A	Sec. 5-B	Sec. 6-A	Sec. 6-B	Sec. 7	Sec. 8
Earth Excavation	Cu. Yds.	124,640	286,330	340,654	1,141	159,410	100,585	146,469	167,990	8,627	158,29
Rock Excavation	“			99,611	6,252	118,252	87,605	147,780	136,028	3,759	13
Tunneling	“				69,015					74,389	
Shaft Excavation	“									309	
Portland Cement Concrete	“	17,642	44,995	62,083	28,932	33,203	26,020	41,557	40,563	14,465	29,540
Natural Cement Concrete	“						39				
Steel Erected	Tons	2,349	5,266	7,539	34	4,039	2,869.164	4,773	5,026	171	2,59
Cast Iron Erected	“		195	320		83	92.491	126	173		12
Brick Masonry (common)	Cu. Yds.	1,109	3,241	4,485		1,733	1,584	2,351	2,564	1,057	2,37
Brick Masonry (facing)	“								41		
Brick Masonry (enameled)	“						279.41	25			2
Pedestal Masonry	“	69	466	851		396	409.78	716	433	17	25
Cut Stone Masonry	“							18	11		
Restoring Street Surface	Sq. Yds.	1,824	2,924	30,846		9,785	25,636	23,774	3,796	181	
Restoring Park Surface	“							5,504		1,911	
Repaving	“										
Vault Lights	“	374	1,228	2,643		638	10,069.45	34	49		368
Steel Delivered	Tons	2,401	5,276	7,563		4,530	2,871.755	5,028	5,579		2,82
Cast Iron Delivered	“		201	326		104	92.491	103	174	171	14
Expended on Stations	Dollars	6,575	21,925	33,700		3,000	24,250	11,700	10,200		2,70
Waterproofing	Sq. Yds.	26,513	99,979	143,827	1,423	64,353	59,081	100,115	86,122	4,869	63,66
Water Pipes, 48-inch	Lin. Ft.					3,495		441			17
Water Pipes, 36-inch	“		5,212	783		519	7	724	2,850		
Water Pipes, 30-inch	“						357				32
Water Pipes, 24-inch	“		339						209		270
Water Pipes, 20-inch	“		895	369		1,499	1,368	6,412	6,168	110	39
Water Pipes, 16-inch	“					12					
Water Pipes, 12-inch	“		5,374	6,682		1,114	865	1,306	1,081		1,1
Water Pipes, 8-inch	“										
Water Pipes, 6-inch	“		2,526	7,348		956	210	156	190		61
Water Pipes, 5-inch	“				893						
Water Pipes, 4-inch	“					46	175				
Water Pipes, 3-inch	“					110					
Water Pipes, 2-inch	“					170					
Gas Pipes, 36-inch	“							124			
Gas Pipes, 30-inch	“		4,721	186		242		248			85
Gas Pipes, 24-inch	“			244				521			
Gas Pipes, 20-inch	“		231	123		1,653	816	620		110	11
Gas Pipes, 16-inch	“	61	857	558							8
Gas Pipes, 12-inch	“	105	503	326		550	150	116			54
Gas Pipes, 10-inch	“		252	39		302		171			180
Gas Pipes, 8-inch	“	112	5,627	17,109		1,377		421			
Gas Pipes, 6-inch	“	235	7,721	13,653		255	380	867			2,581
Gas Pipes, 4-inch	“		531	3,957		264	250	111			653
Gas Pipes, 3-inch	“	46									
Drain Pipes, 15-inch	“										
Drain Pipes, 12-inch	“			1,105	54	70	153	193	142	4,578	139
Drain Pipes, 10-inch	“			3,203	1,464	3,216	3,991	6,784	2,284		
Drain Pipes, 8-inch	“			3,554	898	1,211	1,569	2,741	4,053		203
Drain Pipes, 6-inch	“	107		3,787	1,722	3,005	1,632	1,961	4,550		170
Drain Pipes, 4-inch	“		600	879			2,016	3,629	7,008		488
Drain Pipes, 3½-inch	“			571							
Drain Pipes, 3-inch	“		32	2,933	2,835	1,160		506	81	6,516	125
Mail Tubes, 8-inch	“	3,576	1,977	14,461							
Edison Ducts	“	1,200	13,798	14,139							
Empire City Ducts	“	9,600	11,398	90,299							
Empire City Blow Pipes	“			3,886							
Fire Alarm Ducts	“			605							
Telephone, Telegraph and Electric Light Ducts	“			21,288							
Metropolitan St. Ry. Ducts	“		2,088								
Western Union Tubes	“	2,600									
Track, laid (single)	“	700	20,000	32,000	7,000	6,000	13,000	17,000	14,000	2,100	1,00
Average number of men employed per day	Number	270	396	573	97	732	126	473	662	174	198

EACH SUB-CONTRACTOR TO DECEMBER 31, 1903.

Sec. 9-A River	Sec. 9-B	Sec. 10	Sec. 11	Sec. 12	Sec. 13	Sec. 14	Sec. 15	TOTAL WORK DONE 1900	TOTAL WORK DONE 1901	TOTAL WORK DONE 1902	TOTAL WORK DONE 1903	TOTAL TO DATE
61,089	105,027	8,589	62,050	3,759	98,376	1,754	6,200	135,425	839,708	691,578	245,462	1,912,173
1,872	57,410	751	87,274	149	51,914	4,389	300	18,453	287,457	393,588	117,603	817,101
......	545	......	......	......	132,001	59,327	......	4,293	136,784	133,049	61,151	335,277
......	......	......	......	......	5,686	......	......	5,705	290	......	......	5,995
12,275	26,194	3,977	21,512	1,354	39,896	3,054	2,417	1,619	98,762	209,730	158,477	468,588
......	......	......	1,581	1,211	1,207	......	......	1,189	844	1,907	98	4,038
12	746	4,656	1,529	2,010	1,408	......	8.7	86	9,294	18,497	18,238.864	46,115.864
1,106	43	73	82	34	86	......	......	......	114	399	2,029.491	2,542.491
......	1,250	......	1,574	7	1,084	......	......	91	5,352	10,872	9,003	25,318
......	......	......	142	12	59	......	......	40	......	129	126	295
......	......	......	......	......	......	......	......	......	288	33	6.41	327.41
......	37	323	136	53.08	152	......	111	47	1,689	1,982	753.86	4,471.86
......	......	......	749	225	533	......	......	......	90	697	749	1,536
......	7,122	......	528	196	11,836	......	......	......	8,835	49,288	89,482	147,605
......	......	......	4,769	......	......	......	......	......	1,589	322	14,069	15,980
......	......	485	3,233	22	......	......	94	......	......	507	3,327	3,834
......	......	......	264	......	......	......	......	......	......	2,267	4,400.45	6,667.45
1,291	856	5,860	1,570	2,010	1,719	......	......	7,981	22,501	12,025	6,834.755	49,341.755
......	45	81	82	35	155	......	......	34	462	735	1,605.491	2,836.491
......	600	......	9,800	......	4,100	......	......	......	......	1,300	127,250	128,550
0,384	40,615	......	40,671	......	38,093	96	......	2,132	219,843	339,627	247,642	809,244
......	......	......	......	......	......	......	......	......	3,489	580	42	4,111
......	......	......	528	......	1,115	......	......	7	6,023	4,633	1,075	11,738
......	......	......	......	......	......	......	......	70	287	299	25	681
......	......	......	......	......	......	......	......	......	......	82	818	900
......	......	......	5,865	......	23	......	......	7,334	10,394	3,757	1,619	23,104
......	......	......	......	......	......	......	......	......	12	......	......	12
......	......	......	112	......	243	......	......	481	3,999	9,127	4,280	17,887
......	......	......	54	......	......	......	......	......	......	54	......	54
......	3,302	......	339	......	......	......	......	70	4,356	7,120	4,299	15,845
......	......	......	......	......	......	......	......	......	......	......	893	893
......	......	......	......	......	......	......	......	......	117	104	......	221
......	......	......	......	......	......	......	......	......	......	......	110	110
......	......	......	......	......	......	......	......	......	......	......	170	170
......	......	......	......	......	......	......	......	......	......	86	38	124
......	......	......	......	......	......	......	......	......	1,452	2,123	2,678	6,253
......	......	......	282	......	......	......	......	......	244	803	......	1,047
......	......	......	......	......	......	......	......	436	1,553	870	808	3,667
......	......	......	......	......	......	......	......	......	135	615	806	1,557
......	......	......	......	......	228	......	......	150	201	456	1,715	2,522
......	......	......	......	......	......	......	......	......	......	325	619	944
......	......	......	......	......	......	......	......	......	3,679	15,624	5,343	24,646
......	......	......	......	......	......	......	......	240	4,849	11,652	8,951	25,692
......	......	......	......	......	......	......	......	250	3,336	874	1,306	5,766
......	......	......	......	......	......	......	......	......	......	......	46	46
......	291	......	......	......	......	......	......	......	......	......	291	291
......	......	......	1,276	......	1,568	......	......	592	1,344	3,798	3,544	9,278
......	......	......	1,541	......	110	......	......	......	5,844	13,414	3,335	22,593
......	182	......	1,426	......	3,483	......	......	......	5,028	8,959	5,333	19,320
......	577	......	431	......	1,392	......	......	......	5,942	8,904	4,488	19,334
......	......	......	79	......	141	......	......	......	2,529	7,123	5,188	14,840
......	......	......	......	......	......	......	......	......	571	......	......	571
......	638	......	1,709	......	10,218	696	......	......	3,182	11,126	13,141	27,449
......	......	......	......	......	......	......	......	......	3,888	14,968	1,158	20,014
......	......	......	......	......	......	......	......	......	7,928	15,006	6,203	29,137
......	......	......	......	......	......	......	......	......	22,159	66,594	22,544	111,297
......	......	......	......	......	......	......	......	......	1,086	2,045	755	3,886
......	......	......	5,990	......	......	......	......	......	988	5,990	—438	6,540
......	......	......	......	......	......	......	......	......	4,145	10,285	6,858	21,288
......	......	......	......	......	......	......	......	......	......	2,088	......	2,088
......	......	......	......	......	......	......	......	......	......	......	2,500	2,500
......	......	10,000	5,800	4,500	1,900	......	......	......	......	......	135,000	135,000
177	250	150	347	48	343	76	60	2,233	6,607	7,279	5,114	......

TOTAL AMOUNT OF EXTRA WORK DONE BY

ITEMS	Quantity	LENGTHENING STATION PL							
		Sec. 1	Sec. 2	Sec. 3	Sec. 4	Sec. 5-A	Sec. 5-B	Sec. 6-A	Sec. 6-B
Earth Excavation............	Cu. Yds.	1,970	12,020	12,350	....	5,472	2,532	8,006	11,201
Rock Excavation.............	“	....	....	3,414	62	4,444	2,585	9,170	17,157
Tunneling	“	....	....	....	1,225	....	....	....	....
Portland Cement Concrete...	“	110	2,065	2,788	491	1,112	1,008	2,757	6,06
Natural Cement Concrete....	“	....	....	....	....	....	....	....	....
Steel Erected..................	Tons	13	418	278	47	151	28	162	436
Cast Iron Erected............	“	....	7	24	....	3	13	12	65
Brick Masonry (common)....	Cu. Yds.	117	222	222	....	46	75	84	54
Brick Masonry (facing)......	“	....	....	....	....	....	....	....	....
Pedestal Masonry............	“	....	....	13	....	....	....	....	....
Cut Stone Masonry..........	“	....	....	....	....	....	....	....	....
Restoring Street Surface....	Sq. Yds.	....	....	....	....	507	638	938	55
Repaving	“	....	....	....	....	....	....	....	....
Vault Lights..................	“	....	....	....	....	....	....	....	....
Steel Delivered...............	Tons	13	418	278	52	158	30	169	49
Cast Iron Delivered.........	“	....	7	....	....	3	13	41	7
Waterproofing	Sq. Yds.	100	2,321	3,940	....	2,075	1,659	5,240	6,850
Water Pipe, laid, 36-inch....	Lin. Ft.	....	93	....	....	....	....	....	....
Water Pipe, laid, 8-inch.....	“	....	....	....	....	....	....	....	....
Gas Pipe, laid, 24-inch.......	“	....	....	....	....	....	....	....	....
Drain Pipe, laid, 6-inch.....	“	....	....	....	....	....	....	....	....
Drain Pipe, laid, 4-inch.....	“	....	....	....	....	....	....	....	....
Drain Pipe, laid, 3-inch.....	“	....	....	....	....	....	....	....	....
Track laid (single)...........	“	....	500	300	....	....	....	200	400
Ducts laid (single)...........	“	148,680	723,093	976,386	122,006	495,446	451,524	787,365	659,539
Expended on Station.........	Dollars	....	....	....	....	....	....	....	....

ACH SUB-CONTRACTOR TO DECEMBER 31, 1903.

ORMS, EXTRA TRACK, DUCTS, ETC.										TOTAL EXTRA WORK 1901	TOTAL EXTRA WORK 1902	TOTAL EXTRA WORK 1903	TOTAL TO DATE
c. 7	Sec. 8	Sec. 9-A	Sec. 9-B	Sec. 10	Sec. 11	Sec. 12	Sec. 13	Sec. 14	Lenox Ave. Extension.				
238	10,058	2,217	3,833	125	27,961	69	9,438	....	41,518	12,743	40,897	95,368	149,008
409	....	340	6,458	442	37,694	7	2,513	....	1,723	9,446	38,865	38,107	86,418
334	....	....	....	....	....	....	2,356	216	....	....	2,133	1,998	4,131
197	2,653	688	2,320	10	8,042	59	1,755	....	5,983	771	7,186	30,142	38,099
....	....	....	....	....	627	61	491	....	....	491	619	69	1,179
11	170	44	69	1,622	1,261	561	212	....	270	19	1,372	4,362	5,753
....	61	16	25	....	47	....	49	....	32	....	69	285	354
....	40	3	19	....	187	4	55	....	7	5	100	1,030	1,135
....	....	....	....	....	2	8	1	....	....	....	6	5	11
....	....	....	....	....	87	....	19	....	....	17	75	27	119
....	....	....	....	....	8	22	10	....	....	1	5	34	40
....	....	....	....	....	....	....	981	....	....	....	313	3,301	3,614
....	....	....	....	....	2,562	....	....	....	....	....	....	2,562	2,562
....	171	65	....	....	223	....	....	....	....	....	107	352	459
11	170	44	81	2,064	1,305	561	216	....	636	671	996	5,030	6,697
....	61	16	25	....	47	....	28	....	69	....	129	257	386
138	3,191	942	2,165	....	17,701	....	3,706	....	8,393	2,563	14,562	41,296	58,421
....	....	....	....	....	755	....	....	....	....	....	635	213	848
....	....	....	....	....	13	....	....	....	....	....	13	....	13
....	....	....	....	....	13	....	....	....	....	....	13	....	13
....	....	....	....	....	35	....	....	....	....	24	11	....	35
....	....	....	....	....	67	....	....	....	....	....	67	....	67
....	....	....	....	....	641	....	....	....	....	130	511	....	641
....	....	....	....	5,000	3,000	2,200	400	....	....	....	....	12,000	12,000
,510	398,237	123,458	38,272	234,965	276,045	....	293,508	132,448	14,776	1,320,500	2,558,694	2,314.391	6,193,585
....	....	....	....	....	....	....	....	....	500	....	....	500	500

CONTRACT NO. 2.

The contract requirements of this section were that the work was not to be begun on any portion until the Contractor had delivered sufficient construction material to permit the work on such portion to proceed uninterruptedly. In compliance with this requirement the Contractor demonstrated to the Engineer in September that steel had been fabricated for Section No. 1, a portion of the contract extending from the Post Office to Bowling Green, and consequently permits were issued on September 23, November 13 and December 24. For Sections Nos. 2 and 2-A, the East River tunnel and the approaches thereto in Battery Park, Manhattan, and Joralemon street in Brooklyn, a permit was issued to take effect on January 1, 1903.

On Section No. 1, in order to comply with the contract not to disturb the surface of the street, the Contractor submitted plans which were approved by the Engineer, looking to the removal of the street pavement and the substitution in place thereof of a carefully planked roadway, under which plank roadway work was to proceed from two shafts, one located in front of St. Paul's Church yard and one in front of Trinity Church yard, where their location would not interfere with abutting buildings.

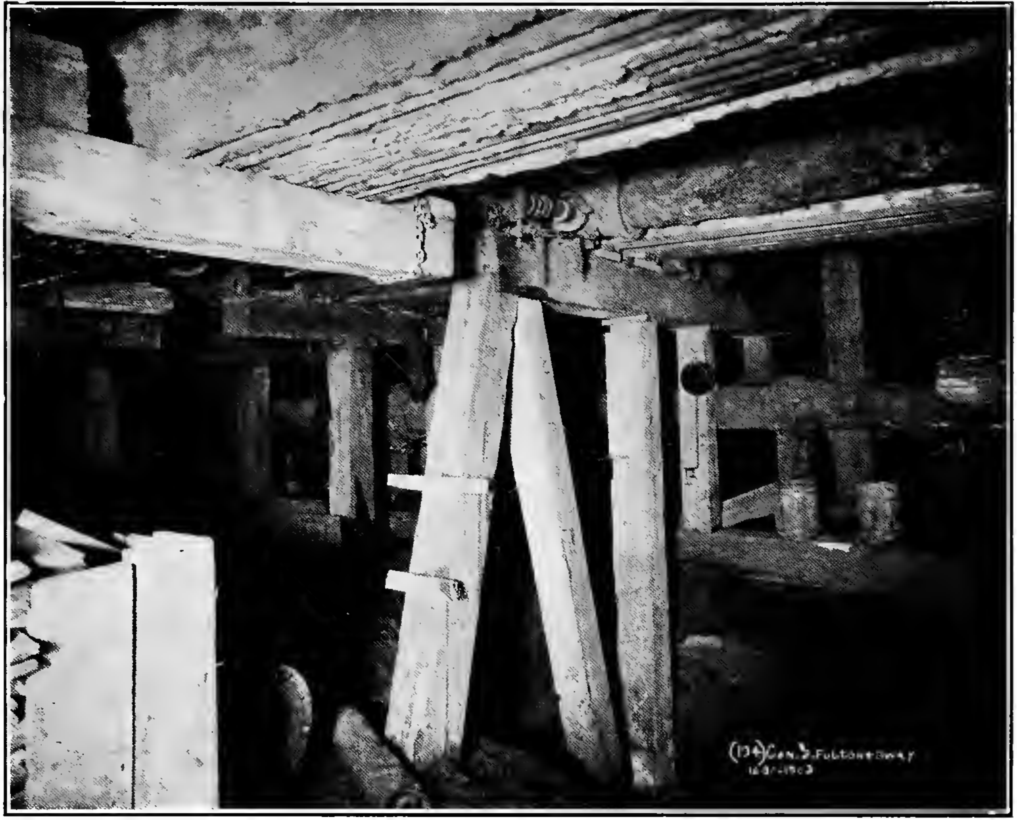
The keeping of the gas mains beneath this plank roadway was deemed objectionable for fear that in case there should be any leakage of gas, such gas, mixing with the air in the confined space, would almost certainly result in a terrific explosion. It was finally arranged with the gas company to lay two temporary mains on trestles over the sidewalk the length of the work. At the suggestion of the Chief Engineer the Contractor made the experiment of removing the soil beneath the pipes and the pavement without disturbing the latter, supporting the pipes and the pavement on a properly designed system of timbering, and thus using the existing pavement as a temporary cover in lieu of the plank roadway described above. After a test of the two methods, the Contractor decided that better progress could be made by the latter than by the former, and the work has since proceeded in this manner southerly from the St. Paul's shaft, and both northerly and southerly from the Trinity shaft, and again northerly from a shaft located at Bowling Green. The subsoil consists entirely of sand.

On Section 2 the work of excavating the Battery Park loop has proceeded satisfactorily. Work was begun in August, and at the end of the year about one third of the total excavation had been made. The construction work is correspondingly advanced.

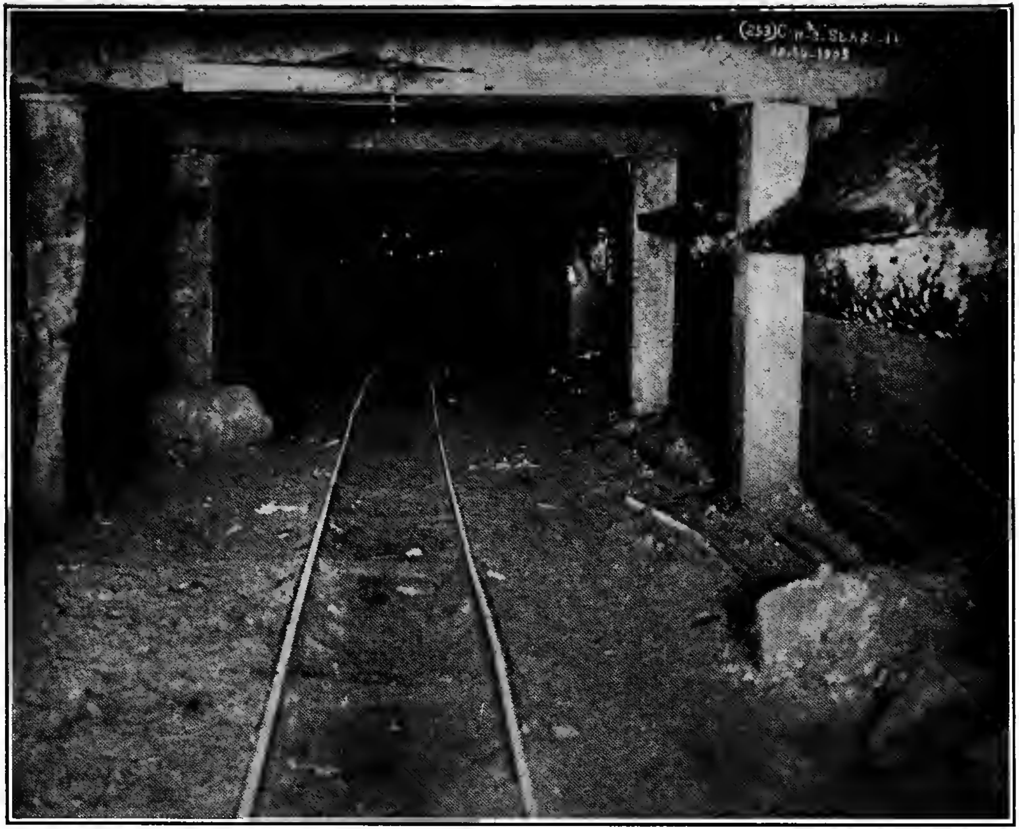
On Section 2-A a double shaft was sunk within the lines of the Battery Park loop, from which two headings were started easterly for the East River tunnels. While rock was encountered in the middle of the shaft, at a depth of 17 feet below the surface, it fell away in the corners nearly to the level of the top of the excavation for the tunnels, so that the Contractor was obliged to excavate with either no rock above or but a thin shell. Although the top of the rock was at a minimum of 10 feet below water, he proceeded for a distance of more than 300 feet from the shaft without resorting to air pressure. Early in December, it having become apparent that a failure of the roof at any time might involve a sudden flow, the air pressure was applied, the locks having been previously installed at a distance of about 90 feet from the shaft. The work has since proceeded under compressed air, with a pressure of from 9 to 10 lbs. per square inch.

The method of construction that followed was one of ordinary excavation, the roof, whether in rock or otherwise, being supported on timber beams set about 5 feet apart, with the ground behind and above carefully sheeted with planks. The tunnel lining at this point consists of cast-iron plates lined with concrete, the outside diameter of the tube being 16 feet 8 inches, the excavation being made large enough for this lining to be put in place. In the space between the lining and the rock broken stone is tightly packed, the voids of which are afterwards filled with Portland cement grout. On completion there will be an iron tubular tunnel lined with concrete on the inside and backed with a heavy masonry jacket on the outside.

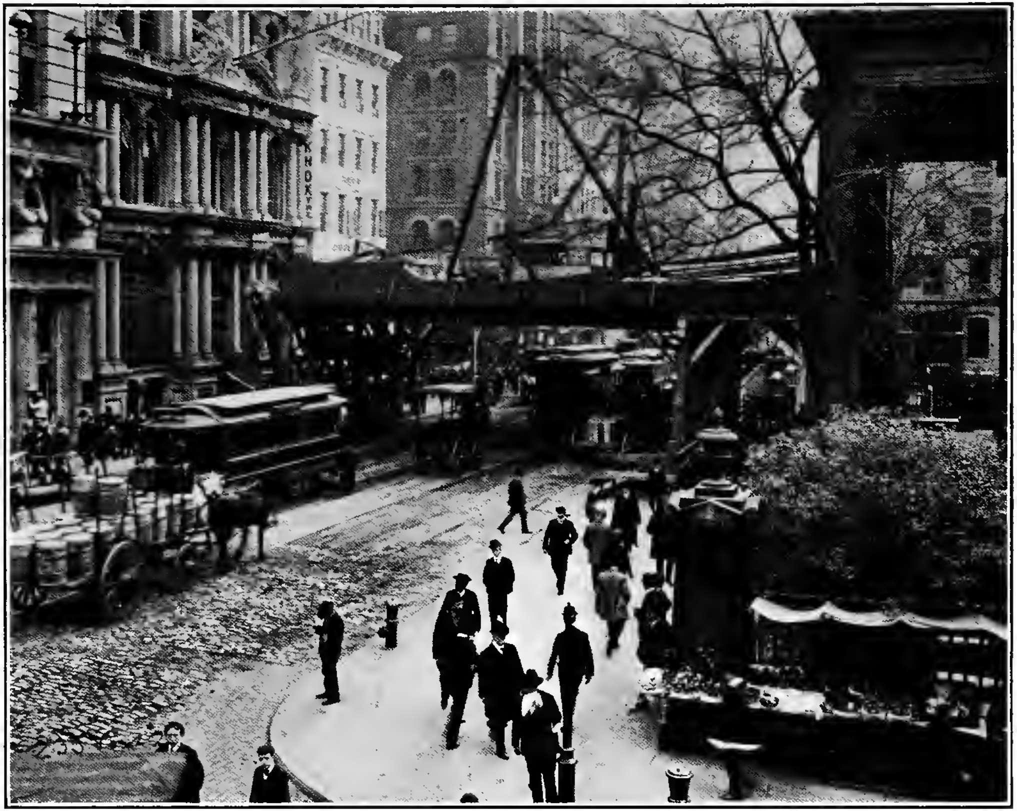
Shafts were sunk in Joralemon street, near Henry street, from which headings were started east from both shafts and west from the south shaft. As the material at this point is wholly sand,



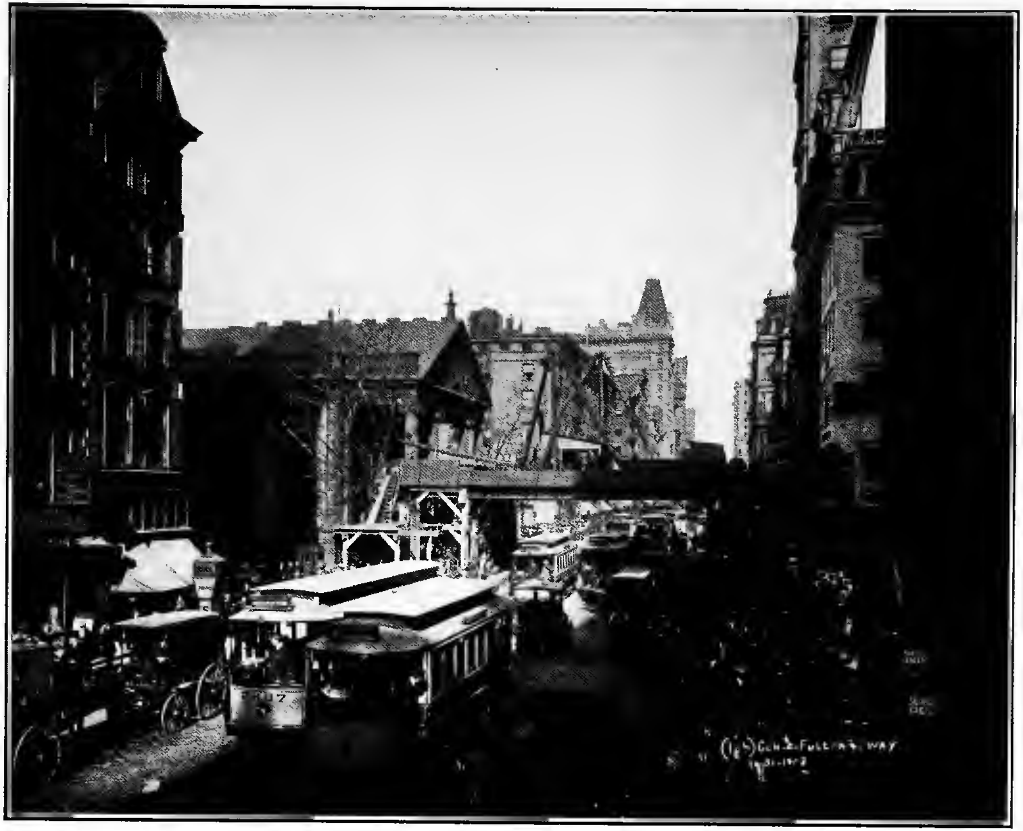
EXCAVATION AND TIMBERING AT BROADWAY AND FULTON STREET.



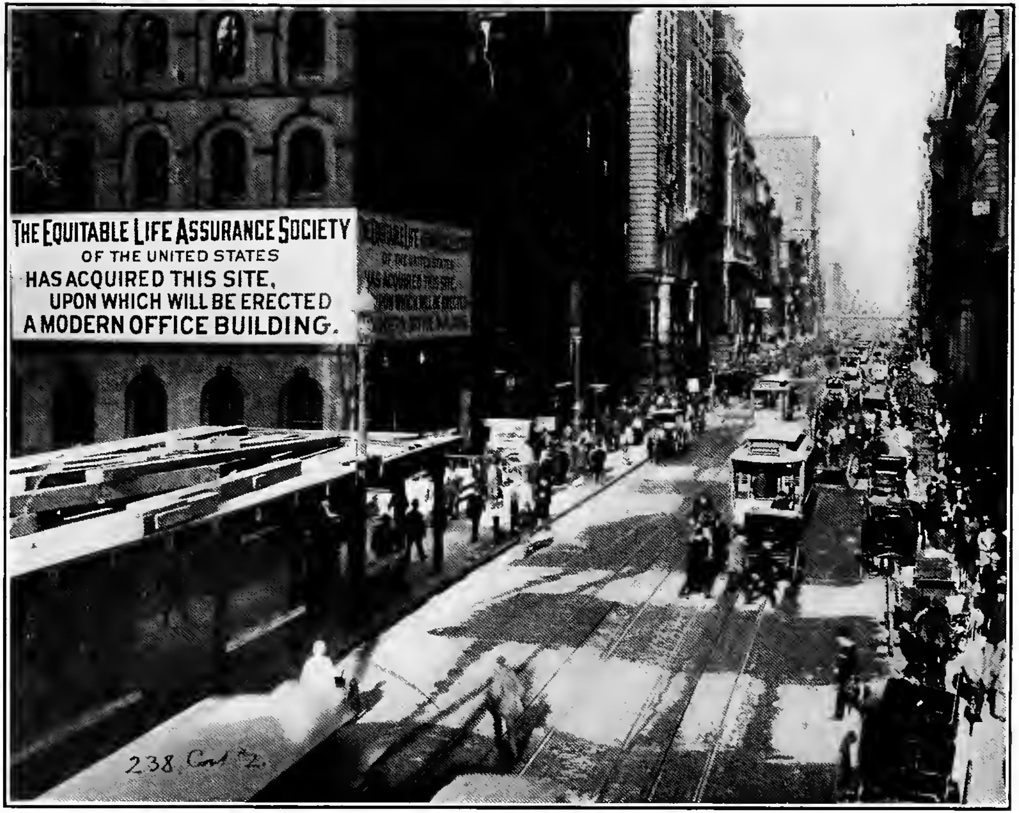
Excavation and Timbering at Broadway near Wall Street.



Broadway, looking South from Vesey St
Working Platform and Shaft.
Excavation for Subway in Progress under Street Surface.



Broadway, looking North from Fulton Street.
Working Platform and Shaft.
Excavation for Subway in Progress under street surface.


THE EQUITABLE LIFE ASSURANCE SOCIETY
OF THE UNITED STATES
HAS ACQUIRED THIS SITE,
UPON WHICH WILL BE ERECTED
A MODERN OFFICE BUILDING.

238 Cat 2.

Broadway, looking North from Wall Street.
Excavation for Subway in progress under the Street Surface.

shields were constructed at the bottom of the shafts. In the easterly headings, excavation being above the level of tide water, compressed air was not necessary. At the end of the year the shields had been driven from these shafts easterly in the southerly heading 583 feet, and in the northerly heading 607 feet. Working westerly from the south shaft, the shield was started on November 12, and had completed 116 feet at the end of the year. As soon as this shield had advanced a sufficient distance, an air lock was at once erected. Compressed air, however, had not been used at the end of the year. The shield at the northerly heading running west had not been started up to the end of the year. The total progress made by the three shields was as follows, together with the number of days from the time that each shield was first started:

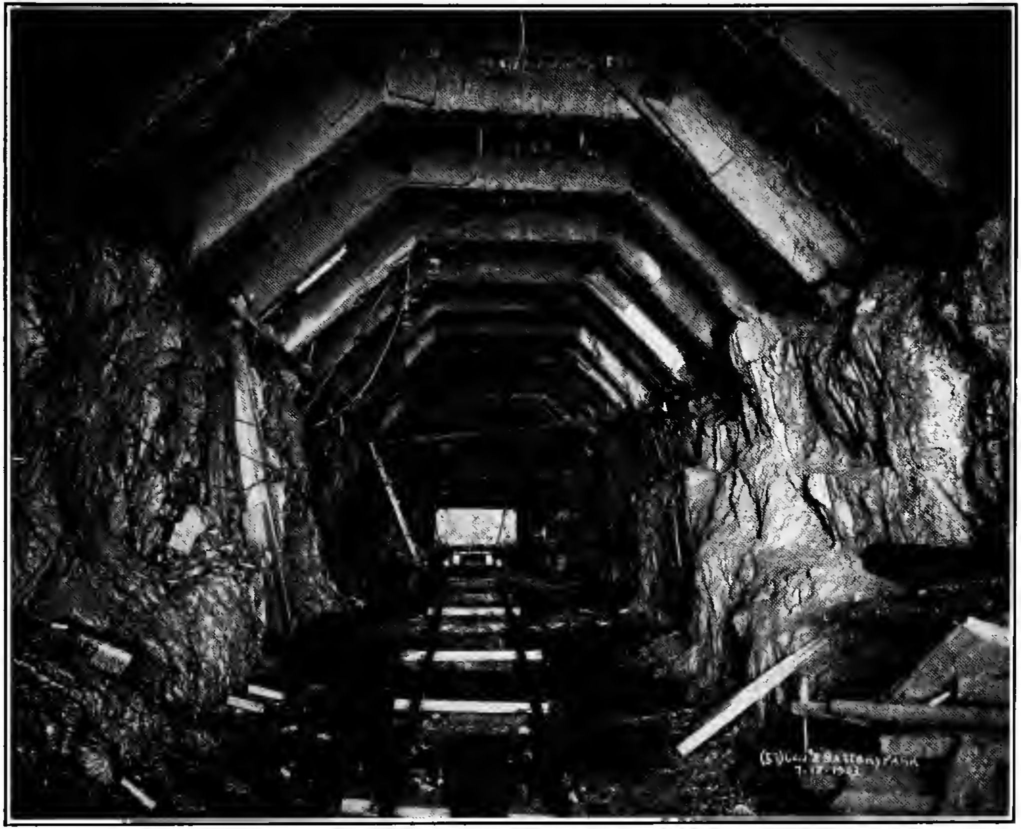
	S. E. HEADING SHIELD NO. 1	N. E. HEADING SHIELD NO. 2	S.W. HEADING SHIELD NO. 3
Advance of Shield begun.....	July 10, '03	Sep. 15, '03	Nov. 12, '03
Total No. of days from date of advance to Dec. 31, 1903	174	107	49
Progress of Shield to Dec. 31, 1903..........................	582.8 ft.	607.1 ft.	116.2 ft.

The work on these shields was done by three shifts of eight hours each. The shields, however, were not being advanced continuously during the period above mentioned, as there were the necessary delays incident to the repairing of the shields, the setting up of the air-locks, etc. Omitting all time lost, the advance on shield No. 1 was made in 98 working days; on shield No. 2 in 93 working days, and on shield No. 3 in 26 working days.

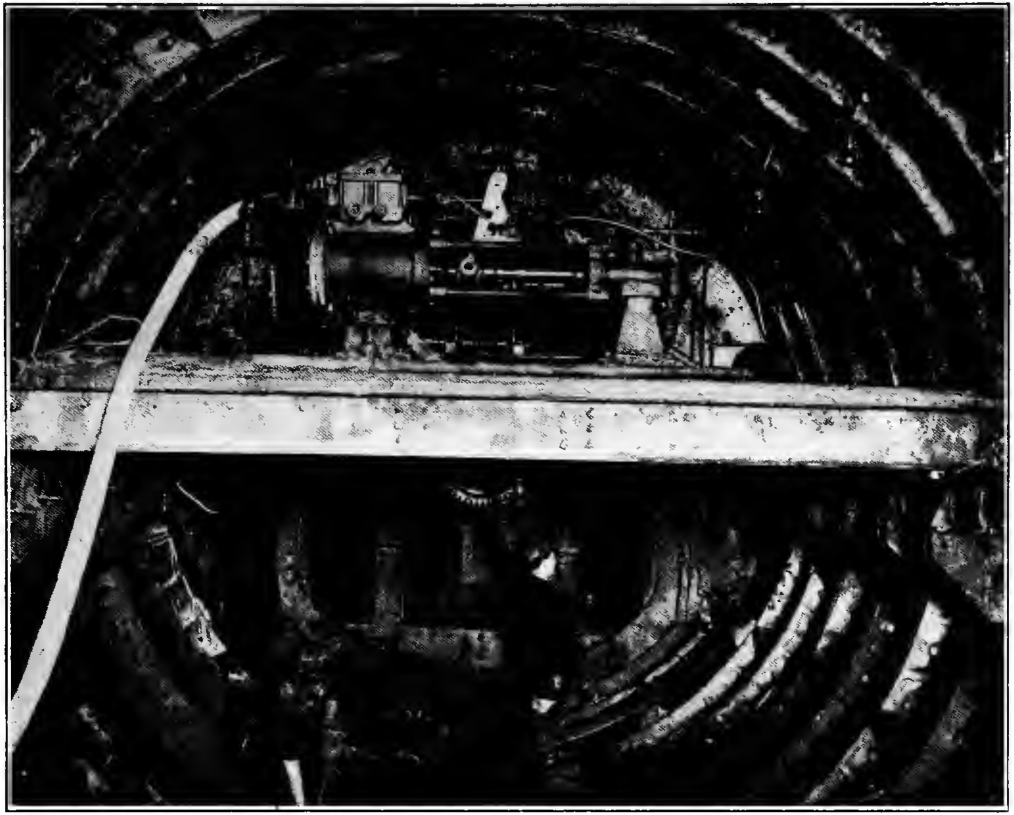
During the year the General Contractor made three contracts for track laying, one with Messrs. Holbrook, Cabot & Daly for all track on Contract No. 1 from the southern end to Forty-seventh street, and one with Messrs. Naughton & Co. for all track laying north from Forty-seventh street, except the track on the viaducts, on Sections 10, 12 and 15, the contract for which was awarded to the Terry & Tench Company. At the close of the year 36½ miles of track had been laid, a large part of which had been ballasted. The track laid consisted chiefly of four tracks from Leonard street to Forty-second street and Park avenue, and one track from that point to Ninety-sixth street, with occasional uncompleted portions; but in all such cases there is at least one track laid, and in addition one or more tracks laid on the west side from Ninety-sixth street to One Hundred and Forty-fifth street, and one track laid on Sections 7 and 8 from Broadway to about One Hundred and Twelfth street and Lenox avenue. Steel rails of the weight of 100 lbs. per yard have been laid on Georgia pine ties, reinforced with tie-plates and supported by a ballast of trap rock broken to pass through a ¾-inch ring. A guard rail is placed on the inside of the outer rail on all curves, which consists of a specially rolled section of steel weighing 57 lbs. per yard, and held to the main rail by bolts passing through spacing blocks of cast-iron.

On the 1st of January, 1904, a party consisting of the Rapid Transit Commissioners, the Mayor, newly installed, Colonel George B. McClellan, the officers of the Rapid Transit Subway Construction Company and a party of invited guests, were enabled to make a continuous trip by hand-car from the station at City Hall to One Hundred and Twenty-ninth street.

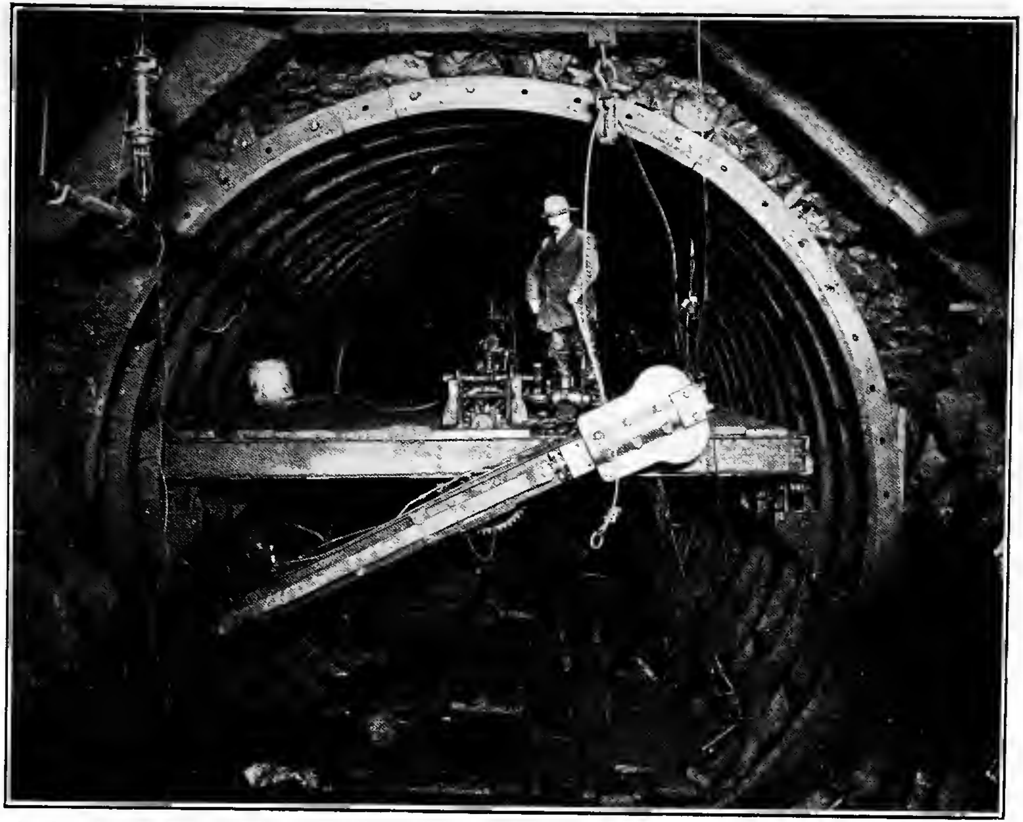
It had always been the view of your Engineer that suitable galleries or chambers should be constructed coincidentally with subways, in which water and gas pipes, pneumatic tubes, electric conduits and other similar sub-surface structures could be installed, and where they would at all times be open to inspection and repair without disturbing the surface of the street. Such disturbance is not only very expensive but is destructive of the pavement, and a constant and intolerable interference with traffic in the crowded streets. Unfortunately, the Rapid Transit Act does not confer power on the Commission to construct such galleries except where necessary for the building of railway subways. This question was taken up by the late President of the Borough of Manhattan, Mr. Jacob A. Cantor, who retained Dr. James C. Bayles to prepare plans. Dr. Bayles conferred with your Engineer and Mr. St. John Clarke, the General Inspector



EAST RIVER TUNNEL. HEADING FROM BATTERY PARK.



[illegible] East River Tunnel. Shield being pushed forward by jacks.



East River Tunnel. Cast Iron Lining and Erector.

of Designs, and submitted to the Borough President plans for such a gallery for Broadway, from Ann street to Wall street, to be built at the same time as the subway. These plans are attached to this report as a matter of interest. Such construction would undoubtedly prove of great benefit to street travel and abutting property. It is to be seriously regretted that the construction is being delayed by certain litigation, which, if not speedily settled, will result in the defeat of the project except as an independent piece of construction, which will greatly increase the expense to the city.

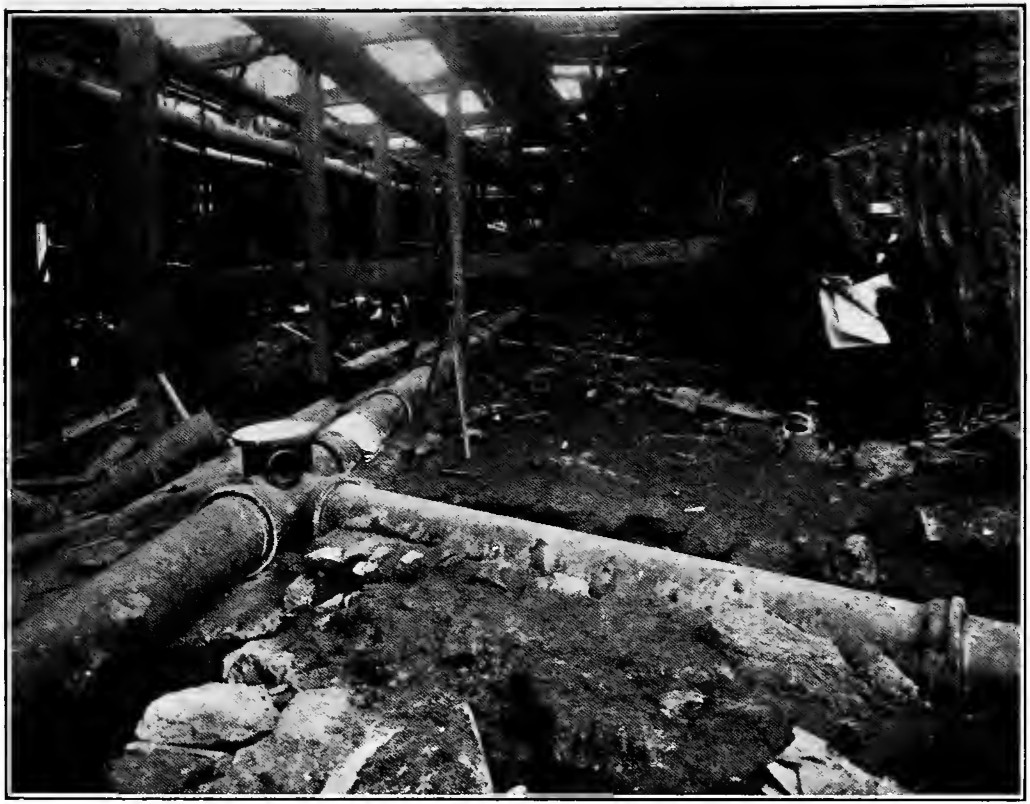
SEWERS.

In the last report it was pointed out that about 80 per cent. of the sewer work in connection with Contract No. 1 had already been completed. During the year a still further advance has been made; so that at the close of the year, 98 per cent. of the longitudinal sewers, *i.e.*, sewers alongside of the subway, had been finished, being 37,273 feet out of a total of 37,895 feet, and 98 per cent. of sewer diversions completed, or 31,658 feet out of a total of 32,584 feet.

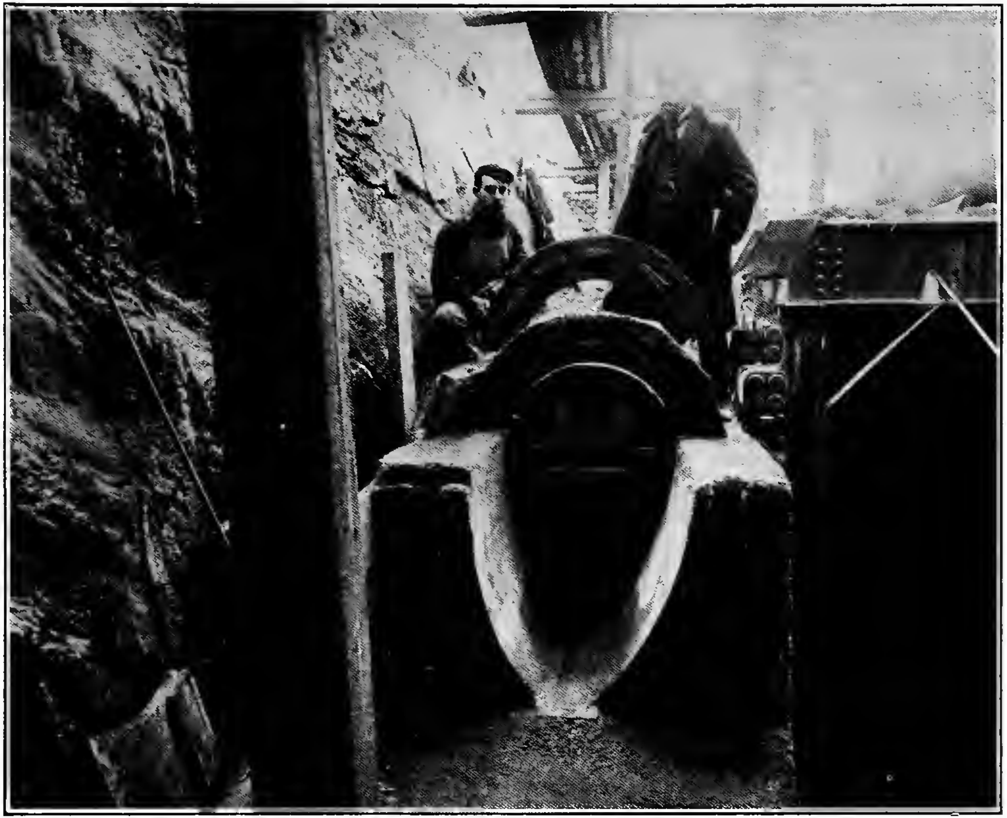
The most important piece of sewer work done during the year in connection with Contract No. 1 has been the sewer diversion along Seventh avenue, running northerly from One Hundred and Forty-fifth street to the Harlem river. In planning the extension along Lenox avenue from One Hundred and Forty-third street to the Harlem river it was found that the drainage of the upper end of Manhattan Island, extending from Lenox avenue to the ridge of Washington Heights and northerly as far as One Hundred and Sixty-second street, drained easterly to Lenox avenue, and at times of severe flood many of the sewers were seriously overburdened. As this section of the country is being rapidly built up and vacant land is being covered with buildings and the streets paved, the burden on the sewers is increasing rapidly. As the volume of flow at times of heavy rain fall is a large amount, it was feared that the overburdened sewers might, in the event of breakage, seriously damage the subway. It was deemed expedient, therefore, not to wait for the slow reconstruction of the sewerage system, but to build at once a large intercepting sewer on Seventh avenue from One Hundred and Forty-fifth street to the Harlem river at the foot of about One Hundred and Fifty-first street, into which all the flow from the above-described territory would pass and so cut off this flow from coming in contact with the subway on Lenox avenue, leaving the sewers on that street to take care of the natural flow of the territory immediately adjacent thereto, which will be small in amount. This sewer joins the old 6ft. 5in. sewer, and is increased to 7 feet circular, and finally to 9 feet 6 inches circular, with an outfall at the river of a longitudinal wooden box 9 feet 6 inches rectangular, supported on piles. The total length of this sewer is 2,116 feet, of which 2,063 feet were built during the year.

In order that the sewer on Lenox avenue should be of ample capacity to take care of the largest possible flow, a sewer has been constructed there in brick with a diameter up to a maximum of 6 feet, but passing beneath the tracks at the northerly end of the Lenox avenue extension in two iron pipes 42 inches in diameter. The total length of this sewer is 1,475 feet 6 inches, of which 1,029 feet 6 inches were completed during the past year. These two large sewers are sufficient to take care of the maximum flow, even when the city is so completely built up that all storm waters will reach the sewers, and their construction now will save the city a large expenditure for such work, which would become necessary by the ordinary progress of city development.

On Contract No. 2, 15,354 feet of sewers will have to be built, of which 10,040 feet are longitudinal sewers and 5,314 are lateral sewer diversions. Of this amount 22 per cent., or 3,317 feet, consisting of lateral sewer diversions, has been done during the year. The sewers reconstructed were on Fulton street, Maiden lane and State street in the borough of Manhattan; the Joralemon street sewer at Borough Hall and the Hudson avenue sewer in Brooklyn. This last sewer is the largest single piece of work so far completed on Contract No. 2, having a total length of 2,210 feet. The construction of this sewer required very careful work, as it lay 30 feet under ground in sand, with elevated railway columns



Cast Iron Sewer beneath Station Platform.



Concrete Sewer Adjacent to Side Wall of Subway.

on each curb of a narrow street, and with large gas mains and electric ducts to be supported during construction.

In the following tables the details of sewer construction are given, and the total amount of work accomplished during the year and to date:

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903

SEWER.	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
Pearl and Duane Sts.	Cunningham & Kearns.	July 23, 1900	5' 0" cir. brick.	....	189	....	235	5' 0" cir. brick
			4' 3" cir. brick.	....	282	....	735	4' 0" cir. brick
			4' 0"x2' 8" bk.	....	717	....	180	4' 0"x3' 6" bk
			24" iron pipe..	....	156	....	50	4' 0"x2' 8" bk
			15" pipe......	....	3	....		
			15" invert.....	....	407	....		
					1754		1200	
Worth Street.......	Degnon-McLean Contracting Co.	Feb. 12, 1903	15" pipe......	152	152	31	290	4' 0" cir. brick
			4' 0"x2' 8" bk.	25	25	....		
				177	177			
Canal Street........	James Pilkington.	May 7, 1900	4' 6"x7' 0" bk.	....	1151	....	1200	4' 0" cir. brick
			6' 6" cir. brick.	...	1833	....	355	4' 0"x3' 0" bk
			5' 6" cir. brick.	....	1035	....	610	4' 0"x2' 8" bk
			4' 6" wooden..	....	936	....	970	3' 6"x2' 8" bk
			4' 0"x2' 8" bk.	....	55	....	40	3' 6"x2' 4" bk
			18" invert.....	....	111	....	235	15" pipe
					5121		3410	

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED	
							LIN. FT.	SIZE
Marion Street......	Degnon-McLean Contracting Co.	Jan. 29, 190	4' 0"x2' 8" bk	....	431	....	431—	4' 0"x3' 0" bk
Spring Street.......	Degnon-McLean Contracting Co.	Sep. 5, 1902	15" pipe.......	5	62	9	105—	12" pipe
Mulberry Street....	Cunningham & Kearns.	May 31, 1900	4' 0"x2' 8" bk	....	228	....	160—	4' 0"x2' 8" bk
Bleecker Street and Connections	James Pilkington.	Mar. 26, 1900	4' 0" cir. brick.	....	563	....		
			4' 0"x2' 8" bk.	....	345	....	560—	5' 4"x4' 6" bk
			30" iron pipe..	....	169	....	325—	4' 0"x2' 8" bk
			24" iron pipe..	....	36	....		
					1113		885	
Astor Place........	Holbrook, Cabot & Daly Contracting Co.	Nov. 11, 1903	15" pipe......	90	90	....		
			12" pipe.......	26	26	82		
				116	116			
East 9th Street.....	James Pilkington.	July 30, 1900	18" pipe.......	....	111	....	50—	3' 2"x2' 0" bk
East 10th Street....	Cunningham & Kearns.	May 31, 1900	3' 6"x2' 4" bk.	....	313	....	240—	4' 0"x3' 1" bk
			30" iron pipe..	....	16	....		
					329			

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR COMPL'D FEET TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED	
							LIN. FT.	SIZE
East 22d Street....	Cunningham & Kearns.	June 11,1900	4′ 6″ cir. brick.	....	1979	....	2041	—4′ 2″x4′ 0″ bk
			42″ iron pipe.	....	114			
			brick chamber.	....	5	....		
					2098			
East 31st Street....	Holbrook, Cabot & Daly Contracting Co.	Sep. 23, 1901	brick chamber.	....	18	....	75	—4′ 0″x2′ 7″ bk
			30″ iron pipe..	....	113	....		
					131			
East 41st Street....	James Pilkington.	Dec. 28,1901	brick chamber	12	12	....	250	—4′ 0″x3′ 0″ bk
			4′ 0″x2′ 8″ bk	323	755	19	169	—4′ 0″x2′ 8″ bk
			24″ iron pipe..	96	96	....		
			16″ iron pipe..	288	449	....		
				719	1312		419	
West 45th Street...	James Pilkington.	Jan. 21, 1901	6′ 6″ cir. brick.	....	177	....	1620	—4′ 0″x2′ 8″ bk
			6′ 0″ cir. brick.	....	848	....		
			5′ 3″x3′ 6″ bk.	....	304	....		
			36″ iron pipe..	....	117	....		
					1446			
West 54th Street.....	Cunningham & Kearns.	Oct. 3, 1900	4′ 0″x2′ 8″ bk.	....	521	....	480	—4′ 0″x2′ 8″ bk

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
59th St. and Circle	Naughton & Co.	Dec. 13. 1900	15" pipe.......	....	398	....	66—	3' 6"x2' 0" bk
65th St. and Broadway.	William Bradley.	Sep. 10, 1900	4' 0"x2' 8" bk.	26	1355	33	507—	4' 0"x2' 7" bk
			3' 6"x2' 4" bk.	....	553	75	186—	3' 7"x2' 5" bk
			18" pipe.......	22	318	....	225—	3' 4"x2' 5" bk
			15" pipe.......	95	381	....	423—	18" pipe
			30" iron pipe..	24	128	....	720—	15" pipe
				167	2735	108	2061	
72d St. and Broadway.	William Bradley.	Oct. 16, 1901	4' 6" cir. brick.	22	22	....	619—	3' 6"x2' 4" bk
			3' 6"x2' 4" bk.	53	701	....	144—	3' 5"x2' 5" bk
			30" iron pipe..	654	654	....	240—	5' 0"x4' 0" bk
				729	1377		1003	
West 81st Street....	William Bradley.	Sep. 10, 1900	6' 0" cir. brick.	....	313	....	375—	5' 8"x5' 0" bk
			48" iron pipe..	....	114	....		
			3' 6"x2' 4" bk.					
			24" iron pipe..					
					427			
Broadway, East Side, 84th to 86th Sts.	William Bradley.	Oct. 24, 1901		14	466	....	528—	3' 6"x2' 4" bk
				11	60	....		
				25	526			

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
West 96th Street....	William Bradley.	Mar. 16,1903	5' 6" cir. brick.	13	13	....	95	6' 9"x6' 2" bk
			3' 6"x2' 4" bk.	139	139	....	317	3' 6"x2' 4" bk
			54" iron pipe.	82	82	....		
			30" iron pipe..	178	178	....		
			12" pipe.......	91	91	....		
				503	503		412	
West 108th Street..	Wm. F. Norton. John Shields.	Sep. 12, 1900	4' 0" cir. brick.	....	430	....	504	4' 0" cir. brick
			4' 0"x2' 8" bk.	35	111	....	94	4' 2"x3' 0" bk
			24" iron pipe..	....	115	....	48	4' 0"x2' 8" bk
					656		646	
West 110th Street..	Farrell, Hopper & Co.	July 19, 1900	6' 6" cir. brick.	....	1116	....	100	4' 0"x2' 8" bk
			4' 0"x2' 8" bk.	....	25	....	30	3' 6"x2' 4" bk
			3' 6"x2' 4" bk.	....	145	....		
			42" iron pipe..	....	183	....		
					1469		130	
Lenox Avenue......	Cunningham & Kearns.	Nov. 1, 1900	5' 0" cir. brick.	....	1468	....	290	4' 0"x2' 8" bk
			4' 4" cir. brick.	....	153	....	1060	3' 6"x2' 4" bk
					1621		1350	

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
West 115th Street..	John Shields.	Jan. 29, 1901	3' 6"x2' 4" bk.	....	526	....	334—	3' 6"x2' 4" bk
			30" iron pipe..	....	48	....	216—	15" pipe
					574		550	
West 124th Street..	Cunningham & Kearns.	July 23, 1900	3' 6"x2' 4" bk.	25	1113	....	70—	3' 0" cir. brick
	Joseph Burns.		15" pipe.......	....	116	....	373—	3' 6"x2' 4" bk
					....		788—	12" pipe
					1229		1231	
West 142d St. and Broadway.	James Pilkington.	Nov. 13, 1900	4' 0" cir. brick.	....	136	....	168—	4' 0" cir. brick
			4' 0"x2' 8" bk.	....	....	22		
			48" iron pipe..	....	32	39		
			3' 6"x2' 4" bk.	....	....	8		
					168	69		
142d St. and Lenox Avenue.	Norton & Dalton.	July 24, 1902	4' 0"x2' 8" bk.	30	812	....	135—	4' 0"x2' 8" bk
			15" pipe.......	....	105	....	320—	15" pipe
					917		455	
149th St. and Railroad Avenue.	J. C. Rodgers.	Aug. 26, 1901	7'x10' brick...	....	30	....	63—	6' 0"x5' 4" bk
			42" iron pipe..	....	97.5	....		
			14" iron pipe..	....	57.5	....		
					185			

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COM-COMPL'D	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
West 157th Street..	Alfred Bradley	July 23, 1900	4' 0" cir. brick.	....	392	....		
			4' 0"x2' 8" bk.	....	45	....	513	—4' 0" cir. brick
			3' 0"x2' 0" bk.	....	69	....		
			48" iron pipe..	....	121	....		
					627			
Broadway, West Side, bet. 156th and 157th Streets.	John B. McDonald	Dec. 7, 1903	15" vit. pipe ..	203	203	95		
			12' vit. pipe ..	....	....	14		
						109		
7th Ave. and 151st Street (Lenox Ave. Extension).	Lenox Construction Co.	Mar. 2, 1903	9' 6" box, wdn.	315	315	....		
			9' 6" cir. brick.	1135	1135	36		
			7' 0" cir. brick.	564	564	17		
			5' 6" cir. brick.	27	27	....		
			3' 6"x2' 4" bk.	22	22	....		
				2063	2063	53		
Lenox Ave., North of 144th Street (Lenox Ave. Extension).	Lenox Construction Co.	Mar. 18, 1903	6' 0" cir. brick.	45	45	....	655	—4' 0"x2' 8" bk
			5' 6" cir. brick.	260	260	....		
			4' 6" cir. brick.	339	339	209		
			4' 0" cir. brick.	20	20	212		
			4' 0"x2' 8" bk.	....	....	25		
			42" iron pipe..	365.6	365.6	....		
				1029.6	1029.6	446		
Grand Totals......				5826.6	31657.6	926	21,612	

DETAILS OF LONGITUDINAL SEWERS TO DECEMBER 31, 1903.

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED	
							LIN. FT.	SIZE
Centre St. and Elm Street (Post Office to Great Jones St.)	Degnon-McLean Contracting Co.	Jan. 12, 1901	4' 0"x2' 8" bk.	67	374	....	190	—9' 0"x6' 0" bk
			3' 6"x2' 4" bk.	778	1152	10	70	—4' 5"x3' 0" bk
			3' 6"x2' 4" bk and concrete	....	465	....	1500	—4' 0"x2' 8" bk
			3' 0"x1' 7" bk.	....	9	....	3800	—3' 6"x2' 4" bk
			36" iron pipe..	....	12	....	20	—16" iron pipe
			30" iron pipe..	....	81	....	120	—15" pipe
			24" iron pipe..	508	654	....	640	—12" pipe
			18" iron pipe..	14	491	....	50	—8" pipe
			18" pipe.......	394	1953	....	80	—5' 0" cir. brick
			16" iron pipe..	173	323	....	210	—4' 0"x3' 0" bk
			15" pipe.......	691	3573	20		
			6" iron pipe...	....	138	....		
				2625	9225	30	6680	

DETAILS OF LONGITUDINAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
Lafayette Place and Fourth Ave. (Great Jones St. to 33d St.)	Holbrook, Cabot & Daly Contracting Co.	Jan. 7, 1901	4' 0" cir. brick.	....	22	....	1100	4' 0" cir. brick
			3' 9" cir. brick.	....	201	....	330	4' 6"x3' 5" bk
			4' 0"x3' 0" bk.	....	474	....	90	4' 1"x3' 7" bk
			4' 0"x2' 8" bk.	....	256	....	730	4' 0"x3' 0" bk
			3' 6"x2' 4" bk.	34	1027	....	30	4' 0"x2' 8" bk
			42" iron pipe..	....	162	....	355	4' 0"x2' 7" bk
			24" iron pipe.	....	45	....	190	3' 9"x2' 7" bk
			20" iron pipe.	....	12	....	50	3' 8"x3' 0" bk
			18" iron pipe.	....	313	....	250	3' 7"x2' 8" bk
			18" pipe	2	1092	....	85	3' 7"x2' 7" bk
			16" iron pipe.	12	258	....	910	3' 6"x2' 4" bk
			15" pipe	685	6837	....	80	3' 5"x3' 4" bk
			12" iron pipe..	115	169	....	15	3' 5"x2' 8" bk
							65	3' 5"x2' 7" bk
							490	3' 5"x2' 3" bk
							540	3' 5"x2' 0" bk
							200	3' 4"x2' 0" bk
							200	3' 0"x2' 0" bk
							25	2' 9"x2' 2" bk
							140	18" pipe
							305	15" pipe
							200	12" pipe
				848	10868	....	6380	

DETAILS OF LONGITUDINAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COM-PLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
Park Ave., 42d St. and Broadway (41st St. to 47th St.)	Degnon-McLean Contracting Co.	Aug. 22, 1901	4' 0"x2' 8" bk	149	601	....	2225	4' 0"x2' 8" bk
			4' 0"x2' 8" concrete.	....	104	....	1671	3' 3"x2' 7" bk
			3' 6"x2' 4" bk.	75	790	14	381	15" pipe
			3' 6"x2' 4" concrete.	18	18	....	422	12" pipe
			36" iron pipe.	80	80	....		
			30" iron pipe.	282	323	....		
			18" pipe	233	323	3		
			16" iron pipe.	24	611	151		
			15" pipe	1288	2222	24		
			14" iron pipe..	201	201	60		
				2350	5273	252	4699	
Broadway (47th St. to 60th St.)	Naughton & Co.	Dec. 22, 1900	4' 0"x2' 8" bk.	....	152	....	324	4' 0"x2' 8" bk
			3' 6"x2' 4" bk.	23	397	....	170	3' 6"x2' 4" bk
			3' 6"x2' 4" concrete.	....	1162	....	267	2' 5"x1' 7" concrete
			18" pipe	....	407	....	2687	15" pipe
			18" iron pipe.	....	231	....	718	12" pipe
			16" iron pipe.	12	101	....		
			15" pipe	262	3124	....		
				297	5574		4166	
Broadway (60th St. to 104th St.)	William Bradley.	Apr. 29, 1902	3' 6"x2' 4" bk.	415.5	825.5	....	471	3' 6"x2' 4" bk
			12" pipe	....	300	....	60	18" pipe
				....	....	....	80	15" pipe
					1125.5		611	

DETAILS OF LONGITUDINAL SEWERS TO DECEMBER 31, 1903—*Continued*

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
Broadway (104th St. to 125th St.)	John Shields.	Aug. 26, 1901	4' 4"x2' 11" bk	....	97	....	92—	4' 4"x2' 11" bk
			3' 6"x2' 4" bk.	....	94	....	90—	3' 6"x2' 4" bk
			18" pipe......	....	41	....		
					232		182	
Broadway (135th St. North.)	James Pilkington.	July 15, 1901	4' 2"x2' 9" bk.	....	79	....	75—	4' 2"x2' 9" bk
			4' 0"x2' 8" bk.	....	67	....	63—	4' 0"x2' 8" bk
			3' 6"x2' 4" bk.	....	155	....	147—	3' 6"x2' 4" bk
					301		285	
Lenox Ave. (135th St. South.)	Farrel, Hopper & Co.	Apr. 25, 1904	4' 0"x2' 8" bk.	18	232	....	218—	4' 0"x2' 8" bk
							36—	3' 0"x2' 0" bk
							254	
Lenox Ave. (135th St. North.)	J. C. Rodgers.	June 23, 1902	4' 0"x2' 8" bk.	3	21	....	19—	4' 0"x2 8" bk
East 149th Street..	J. C. Rodgers.	Nov. 20, 1901	18" pipe......	....	710	....	710—	18" pipe
			15" pipe......	....	722	230	140—	15" pipe
			12" pipe.....	566	2611	110	1625—	12" pipe
			12" iron pipe.	183	183	..		
			6" pipe...	159	159	....		
			6" iron pipe.	36	36	....		
				944	4421	340	2475	
Grand Totals.......				7500.5	37272.5	622	25751	

DETAILS OF LATERAL SEWERS TO DECEMBER 31, 1903—CONTRACT NO. 2

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED LIN. FT.	OLD SEWER REMOVED SIZE
Fulton St., New York	James Pilkington.	Apr. 21, 1903	3' 6"x2' 4" bk.	314	314	....	5	3' 6"x2' 8" bk
Maiden Lane, New York.	James Pilkington.	Mar. 2, 1903	3' 6"x2' 4" bk.	332	332	....	332	4' 5"x5' 5" bk
			3' 0"x2' 0" bk.	10	10	....	10	3' 0"x2' 0" bk
				342	342		342	
State St,, New York	James Pilkington.	Nov. 8, 1902	4' 0"x3' 0" bk.	336	336	....	25	4' 0"x3' 6" bk
Joralemon St., at Borough Hall, Brooklyn.	Cranford & McNamee.	Mar. 21,1903	12" pipe......	115	115	....		
Hudson Ave., Brooklyn.	Cranford & McNamee.	Mar. 30,1903	4' 6"x3' 0" bk.	2180	2180	144	446	3' 6"x2' 4" bk
			42" iron pipe..	....	....	74	745	15" pipe
			15" pipe......	30	30	....	966	12" pipe
				2210	2210	218	2157	
Ashland Place, Brooklyn.	Cranford & McNamee.	Not begun.	6' 0" cir. brick.	....	....	1072		
			6' 0"x4' 0" bk.	....	....	255		
			60" iron pipe..	....	....	12		
			36" iron pipe..	....	....	420		
			18" pipe......	....	....	20		
						1779		
Grand Totals.......				3317	3317	1997	2529	

DETAILS OF LONGITUDINAL SEWERS TO DECEMBER 31, 1903—CONTRACT NO. 2

SEWER	NAME OF SUB-CONTRACTOR	DATE BEGUN	SIZE	LINEAR FEET COMPL'D DURING 1903	LINEAR FEET COMPL'D TO DEC. 31, 1903	LINEAR FEET TO BE COMPLETED	OLD SEWER REMOVED	
							LIN. FT.	SIZE
Broadway, City Hall, to Battery Place, New York.	Degnon Contracting Co.	Not begun.	3' 6"x2' 4" bk.	....	....	1094	190—	4' 0"x3' 0" bk
			3' 0"x2' 4" concrete........	....	....	320	15—	3' 3"x3' 7" bk
			18" iron pipe..	....	....	247		
						1661	205	
Fulton St., Borough Hall to Flatbush Ave., Brooklyn.	Cranford & McNamee.	Not begun.	18" pipe	....	....	2870		
			18" iron pipe..	....	....	60		
			15" pipe	....	....	422		
			12" pipe	....	....	2395		
						5747		
Flatbush Ave., Fulton St., to Atlantic Ave., Brooklyn.	Cranford & McNamee.	Not begun.	18" pipe	....	....	547		
			18" iron pipe..	....	....	160		
			15" pipe	....		270		
			14" iron pipe..	....	....	160		
			12" pipe	....	....	1495		
						2632		
Grand Totals.......						10,040	205	

During the year the Department of Inspection of Material, in charge of Mr. W. A. Aiken, has been occupied as heretofore in the testing and inspection of the various materials entering into the construction of the subway. The past year showed completion of all work, both mill and shop, at the Pencoyd Iron Company, and the inception of work at the Baltimore Bridge Company's shops, Baltimore, for Contract No. 2. Inspection was begun at the Scottdale works of the U. S. Cast Iron Pipe & Foundry Company, and of rails at the Maryland Steel Company, Sparrows Point, and of track fittings at the Pennsylvania Steel Company at Steelton.

The total weight of steel accepted at the mills since commencing work amounts to—

For Contract No. 1..........	143,516,431 lbs.
“ “ No. 2...........	7,164,004 “

Weight accepted during 1903—

For Contract No. 1..........	40,325,691 lbs.
“ “ No. 2...........	7,164,004 “

The total weight of steel accepted to date for Contract No. 1 above noted, viz., 143,516,431 lbs., compared with the same item, 103,324,596 lbs., in last year's report, with 40,325,691 lbs. for 1903 added to the latter, while apparently should agree, shows, however, a difference of 133,856 lbs. This is made up of 121,532 lbs. scrapped at the several plants, Keystone, Pencoyd and Trenton, resulting from use of material on orders placed in 1903, of material accepted previously, requiring cutting to different lengths, and 12,324 lbs. actually transferred from Contract No. 1 to Contract No. 2.

Steel was rolled at the following mills:

	Contract No. 1.	Contract No. 2.
Carnegie Steel Co.......	33,787,608 lbs.	6,856,215 lbs.
Pencoyd Iron Works ...	5,771,080 “	303,174 “
Central Iron & Steel Co..	4,615 “	4,615 “
Lukens Iron & Steel Co..	616,852 “	....
American Pressed Steel Co.	3,595 “	....
Jones & Laughlins, Ltd..	138,870 “	....
Bethlehem Steel Co.....	2,406 “	....
American Sheet Steel Co.	665 “	....
Totals..........	40,325,691 lbs.	7,164,004 lbs.

This material was distributed for manufacture into finished work at the several branches of the American Bridge Company, and the Baltimore Bridge Company, as follows:

	Contract No. 1.	Contract No. 2.
Keystone branch......	92,810 lbs.	....
Pencoyd branch........	6,959,833 "	125,670 lbs.
Trenton branch........	19,345,097 "	794,295 "
Athens branch.........	13,815,748 "	1,350,183 "
Brooklyn branch.......	112,203 "	3,541,439 "
Baltimore Bridge Co....	....	1,352,417 "
Totals..........	40,325,691 lbs.	7,164,004 lbs.

There remain unshipped to date, either in course of manufacture or rejected, the following tonnage at the several shops:

	Contract No. 1.	Contract No. 2.
Keystone branch.......	1,494,060 ℔s.	....
Pencoyd branch.......	....	22,200 ℔s.
Trenton branch........	13,288,415 ℔s.	....
Athens branch.........	9,556,486 "	364,883 ℔s.
Brooklyn branch......	....	3,540,548 "
Baltimore Bridge Co..	....	14,449 "
Totals..........	24,338,961 ℔s.	3,942,080 ℔s.

This to be credited:

	Contract No. 1.		Contract No. 2.
To East Side Viaduct.	11,190,737 ℔s.	Section No. 1	3,562,748 ℔s.
To West Side Viaduct.	9,806,934 "	Section No. 2	14,449 "
To Subway	3,341,290 "	Section No. 3	364,883 "
Totals	24,338,961 ℔s.		3,942,080 ℔s.

During 1903 there were made 5,859 tensile tests on steel. These represent:

2,419 Heats on Contract No. 1
424 Heats on Contract No. 2

Of the former, 20 represent rivet, tie-rod and anchor-bolt material, and 6 cover material under "Manufacturers'" specifications, a concession on certain small unimportant work.

Of the latter, 9 represent rivet, tie-rod and anchor-bolt material.

The result of all accepted tests on regular material show:

32.58 per cent. or 1,403 tests, giving an average minimum ultimate strength per square inch between 58,000 lbs. and 60,500 lbs. for Contract No. 1	59,469 lbs.
39.09 per cent. or 308 tests, giving an average minimum ultimate strength per square inch between 58,000 lbs. and 61,000 lbs. for Contract No. 2	59,370 lbs.
14.95 per cent. or 644 tests, giving an average maximum ultimate strength per square inch between 63,500 lbs. and 66,000 lbs. for Contract No. 1	64,950 lbs.
12.69 per cent. or 100 tests, giving an average maximum ultimate strength per square inch between 65,000 lbs. and 68,000 lbs. for Contract No. 2	66,660 lbs.
52.47 per cent. or 2,260 tests, giving an average ultimate strength per square inch approximating the mean of the specifications (62,000) for Contract No. 1	62,066 lbs.
48.22 per cent. or 380 tests, giving an average ultimate strength per square inch approximating the mean of the specifications (63,000) for Contract No. 2	62,660 lbs.

The average ultimate strength of all accepted regular material tests was—

For Contract No. 1	61,651 lbs.
" " No. 2	61,880 "

The average elastic limit of all accepted regular material showed—For Contract No. 1, 38,240 lbs. per square inch, as compared with specification minimum requirement of 33,000 lbs.; and, similarly, for Contract No. 2, 38,480 lbs. per square inch, as compared with specification minimum requirement of 35,000 lbs.

The average elongation of all accepted regular material showed —For Contract No. 1, 25.78 per cent., as compared with specification minimum requirement of 20 per cent.; and for Contract No. 2, the average elongation was 27.85 per cent., as compared with specification minimum requirement of 22 per cent.

The average reduction of area of all accepted regular material showed—For Contract No. 1, 52.6 per cent.; and for Contract No. 2, 52.9 per cent., as compared with specification minimum requirement of 44 per cent.

Records of inspection show.	Contract No. 1.	Contract No. 2.
Heats originally rejected....	215	35
" on retest rejected....	51	14
" on retest accepted....	118	37

Of the foregoing total rejected heats for Contract No. 1,

170 were rejected on physical tests alone, of which:

114 were submitted by Carnegie Steel Company,
56 were submitted by Pencoyd Iron Works.

75 were rejected on chemical tests alone, of which:

29 were submitted by Carnegie Company,
44 were submitted by Pencoyd Iron Works,
1 was submitted by Lukens Iron and Steel Company,
1 was submitted by Central Iron and Steel Company.

21 were rejected on both physical and chemical tests, of which: which:

5 were submitted by Carnegie Company,
16 were submitted by Pencoyd Iron Works.

Of the total rejected heats on Contract No. 2,

41 were rejected on physical tests alone, of which:

30 were submitted by Carnegie Steel Company,
11 were submitted by Pencoyd Iron Works.

6 were rejected on chemical tests alone, all submitted by Carnegie Steel Company.

2 were rejected on both physical and chemical tests, both submitted by Carnegie Steel Company.

Comparison between results of tests made during 1903 and those previously, show a remarkable uniformity in structure as well as chemical composition, of the material accepted for the work.

The total weight of finished material shipped from the shops since commencing work amounts to 119,320,292 ℔s. for Contract No. 1, and 3,225,964 ℔s. for Contract No. 2; the weight accepted during 1903 being 29,539,242 ℔s. The latter was manufactured at the following shops:

	Contract No. 1.	Contract No. 2.
Keystone branch.......	92,810 ℔s.	....
Pencoyd branch	10,289,908 "	103,470 ℔s.
Trenton branch..	10,237,549 "	799,575 "
Athens branch.........	5,220,527 "	985,300 "
Brooklyn branch.......	472,484 "	891 "
Baltimore Bridge Co...	.....	1,336,728 "
Totals.	26,313,278 ℔s.	3,225,964 ℔s.

The following list shows some of the most important instances of errors in shop work corrected through inspection:

Number of errors in faced length of columns, beams and girders	40
Number of errors in connections on columns, beams and girders	151
Number of pieces cut apart and re-riveted........... ..	26
Number of pieces chipped, coped and reamed.............	879
Number of pieces of finished work re-straightened.........	571
Number of pieces scraped and re-painted.................	255
Number of pieces rejected for bad punching..............	26
Number of pieces of finished work finally rejected.........	41
Number of holes screw-plugged on account of mispunching.	296
Number of holes changed for field connection.............	611
Number of holes omitted and drilled later................	329
Number of connections reset............................	136
Number of pieces of material omitted by shop............	66

A comparison between actual shipped weights and estimated weights of material on all drawings on which work has been finished to date shows:

	Contract No. 1.	Contract No. 2.
Shipped weight of......	99,574,974 lbs.	903,045 lbs.
Estimated weight of....	99,217,078 "	902,777 "

These totals thus indicate an average excess in weight of only .36 of one per cent. for Contract No. 1, and .03 of one per cent. for Contract No 2, the allowed specification variation being 2.5 per cent. deficiency.

Cast-iron material has been furnished by the same foundries as previously, with the addition of the Davis & Thomas foundry, Catasauqua, Pa., supplying segments for both the Harlem and the East River tunnels, and one small lot of pipe by the U. S. Cast Iron Pipe and Foundry Co., at Scottdale, Pa.

The total weight of cast material accepted and shipped since the beginning of work amounts to 26,157,341 lbs. The weight for Contract No. 1 shipped during 1903 was 4,796,986 lbs., and for Contract No. 2, 8,973,986 lbs., a total of 13,770,972 lbs. This was cast at the following foundries:

	Contract No. 1.	Contract No. 2.
Warren Foundry and Machine Co..........	207,798 lbs.	....
Reading Foundry Co....	12,375 "	....
Donaldson Iron Co..:..	569,715 "	203,417 lbs.
Glamorgan Pipe and Foundry Co..........	163,228 "	....
U. S. Cast Iron Pipe and Foundry Co..........	145,376 "	....
Foran Foundry and Machine Co	1,149,499 "	250,660 lbs.
Davis and Thomas Co...	2,549,045 "	8,519,909 "
Totals	4,796,986 lbs.	8,973,986 lbs.

In addition to the above amount of cast-iron accepted during 1903, 1,005,446 tbs. were carefully inspected but rejected. All rejections of cast material were due to poor workmanship and not to the quality of stock material.

305 tensional tests were made, showing an average ultimate strength of 26,259 tbs. per square inch—the average specification requirement being 21,000 tbs. per square inch.

309 transverse tests showed under specification conditions an average loading per square inch before rupture of 800 tbs.—the specification requirement being 750 tbs.

Early in the year, rolling of 100-tb. T rails was commenced at the works of the Maryland Steel Co. at Sparrows Point, and of check rails and track fittings at the works of the Pennsylvania Steel Co. at Steelton, and has been carried on at intervals as required.

There have been accepted during 1903 at the Maryland Steel Co., Sparrows Point, of 100-tb. rails....19,227,168 tbs.. No. 1
" 100-tb. rails.... 970,300 tbs. No. 2

There has been accepted during 1903 at the Pennsylvania Steel Co., Steelton, of 57½-tb. check rails.....2,227,275 tbs. No. 1
" 57½-tb. check rails..... 18,785 " No. 2
12,543 Pairs splices for 100-tb. rails.... 709,192 "
5,000 Pairs Weber Joints for 100-tb. rails .... 435,728 "
500 Insulating pieces for 100-tb. rails. 41,955 "
3,578 Pairs splices for 57½-tb. check rails .... 84,244 "
14,312 Bolts for 57 1-2 tb. check rails.. 17,564 "
Total Tonnage (long) of No. 1 rails....$8574\frac{1248}{2240}$ Tons.
Total Tonnage (long) of No. 2 rails.... $433\frac{380}{2240}$ "

As a part of the inspection of rail material, comparative chemical determinations were made on drillings from identical finished sections, from such blows of steel, from which drop-test pieces were selected. Comparison with corresponding ladle analyses showed very satisfactory results.

Surface inspection showed following results after material had passed original mill inspection by Maryland Steel Company:

Number of rails re-straightened	586
Number of rails cut off	114
Number of rails rejected as scrap	61
Number of rails accepted only as No. 2 quality	473

The total amount of cement shipped since the commencement of the work amounts to 336,173,020 lbs.; the amount shipped during 1903 being 128,316,230 lbs. The latter was divided as follows:

	Contract No. 1.	Contract No. 2.
325,898 barrels Portland cement	121,075,410 lbs.	2,766,020 lbs.
14,916 " Natural "	4,474,800 "	....
Totals	125,550,210 lbs.	2,766,020 lbs.

The amount of Portland cement accepted during 1903 is divided as follows:

American Giant	307,841½	bbls.
Helderberg	15,144½	"
German imported	5,500	"
Total	328,486	bbls.

The average results from complete tests of 196 accepted bins of American Giant, of 1,570 barrels each, show:

FOR NEAT BRIQUETTES	24 HOURS	7 DAYS	28 DAYS
Average results	309 lbs.	745 lbs.	854 lbs.
Specification requirements	150 lbs.	400 lbs.	500 lbs.
FOR SAND BRIQUETTES			
Average results		423 lbs.	529 lbs.
Specification requirements		200 lbs.	300 lbs.

The average results from complete tests of 17 accepted lots of Helderberg, of 890 barrels each, show:

FOR NEAT BRIQUETTES	24 HOURS	7 DAYS	28 DAYS
Average results	166 lbs.	668 lbs.	794 lbs.
Specification requirements	150 lbs.	400 lbs.	500 lbs.
FOR SAND BRIQUETTES			
Average results		329 lbs.	478 lbs.
Specification requirements		200 lbs.	300 lbs.

The average results from complete tests of 6 accepted lots of German imported, of 917 barrels each, show:

FOR NEAT BRIQUETTES	24 HOURS	7 DAYS	28 DAYS
Average results	264 lbs.	490 lbs.	604 lbs.
Specification requirements	150 lbs.	400 lbs.	500 lbs.
FOR SAND BRIQUETTES			
Average results		280 lbs.	362 lbs.
Specification requirements		200 lbs.	300 lbs.

Results obtained are shown below, covering percentage of gain, both neat and in sand mixtures, as well as the average results of boiling tests of all accepted Portland cement.

	PER CENT. INCREASE 7 TO 28 DAYS		AVERAGE STRENGTH OF BOILED BRIQUETTES
	NEAT	SAND	
American Giant	14.6	25.0	681 lbs.
Helderberg	18.9	45.3	621 lbs.
German imported	23.3	31.0	424 lbs.

The only brand of imported German cement accepted was Hanover—no Alsen, which constituted the bulk of imported cement used in 1902, having been submitted during 1903.

Of natural cement, the only brand offered was Union, manufactured by the American Cement Company. The average results for complete tests of 13 accepted bins of 1,315 barrels each. show:

FOR NEAT BRIQUETTES	7 DAYS	28 DAYS
Average results	240 lbs.	343 lbs.
Specification requirements	125 lbs.	200 lbs.
FOR SAND BRIQUETTES		
Average results	230 lbs.	346 lbs.
Specification requirements	100 lbs.	150 lbs.

During the year 1903 there have been broken of Portland cement 39,642 briquettes. Of these 433 failed or slightly over one per cent., the bulk of the failures being in cement not manufactured by the American Cement Company, and condemned.

Of Portland cement with sand, 25,700 briquettes. 56 failing.

Of Neat Natural cement, 1,075 briquettes.....None failing.

Of Natural cement with sand, 1,075 briquettes. None failing.

Total number of all briquettes, neat........	40,717
Total number of all briquettes, sand........	26,775

Total amount of cement inspected during the year—Portland, 474,468 barrels, of which 328,486 barrels were accepted and 145,982 barrels, either rejected or turned over to American Cement Co., at 7 days on account of high results at that period. 28-day tests of such material always showed, however, except in a single instance, that the material would have been rejected in any case on 28-day results.

Natural cement inspected during the year for Contract No. 1—18,396 barrels, of which 17,096 barrels were accepted and 1,300 barrels rejected.

Portland Cement: Average results of all accepted American Giant tests during year periods:

NEAT.

	1 DAY	7 DAYS	28 DAYS
1900	229 lbs.	582 lbs.	714 lbs.
1901	300 "	645 "	763 "
1902	317 "	703 "	800 "
1903	309 "	745 "	854 "

SAND 2 TO 1.

	7 DAYS	28 DAYS
1900	276 lbs.	434 lbs.
1901	380 "	525 "
1902	419 "	545 "
1903	423 "	529 "

The contract for cement to be furnished for Contract No. 2 has been divided among the American Cement Co., the Lawrence Cement Co. and the Vulcanite Cement Co. The first company has submitted practically no cement for inspection, the specifications for such material having been met generally by the materials furnished for Contract No. 1; so that there has at all times been a large amount of cement on storage with the American Cement Co., manufactured for Contract No. 1, but which fully met the requirements of cement to be used on Contract No. 2, and which was drawn on as required.

Total amount of cement inspected during the year for Contract No. 2 amounted to 12,655 barrels, of which 3,455 barrels were accepted and 9,200 barrels were rejected.

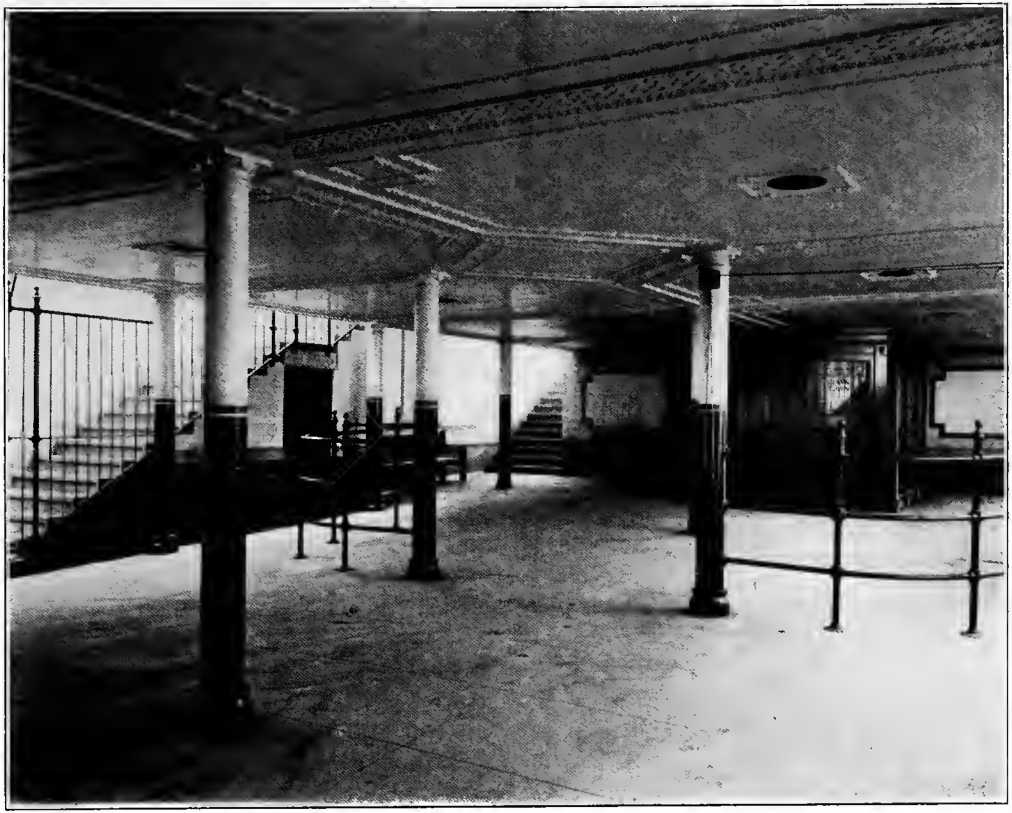
The work accomplished by the chemical laboratory of the department of tests was:

Number of steel analyses made on ladle samples....	71
Number of steel analyses made on finished material..	4,213
Number of paint samples analyzed..............	95
Number of oil samples analyzed......	32
Number of asphalt samples analyzed............	4
Number of cement samples analyzed..............	344
Number of special determinations................	26
Total	4,785

STATIONS.

The chief feature of construction taken in hand during the year has been in connection with the stations.

On Contract No. 1 there are forty-nine stations, of which thirty-seven are in the subway and twelve on the viaduct. As explained in the last report, at the close of the year 1902 the general principle of station equipment had been determined, and the detail plans had been so far completed that contracts were let and work was already in hand upon the stations at City Hall, Bleecker street, Twenty-eighth street and Columbus circle. During the year the general principle thus established had been rapidly developed by the Consulting Architects, Messrs. Heins & LaFarge, and plans for twenty-five stations, being all the subway stations, except those in the deep tunnels at One Hundred and Sixty-eighth and One Hundred and Eighty-first streets and at Mott avenue had been completed. Thirty-nine sub-contracts covering the various details of fittings and finishing have been executed by the sub-contractor, of which the engineering department was duly advised. The work of finishing treatment is at this time progressing satisfactorily upon twenty-two stations. The stations at City Hall, Bleecker, Twenty-eighth, Thirty-third, Fiftieth, Columbus circle, Sixty-sixth and Eighty-sixth streets are very nearly completed, the only work remaining being in connection with the ticket



Twenty-eighth Street Station.

Columbus Circle Station.

booths, floors, railings, the kiosks covering the stairways leading to the sidewalks, the toilet rooms and a few minor details.

The detail plans have been prepared for the ticket booths, doors, kiosks, railings and gates, and the requisite sub-contracts have been let. Some of the ticket booths, doors and kiosks have already been erected. Plans are now being prepared for the elevated stations.

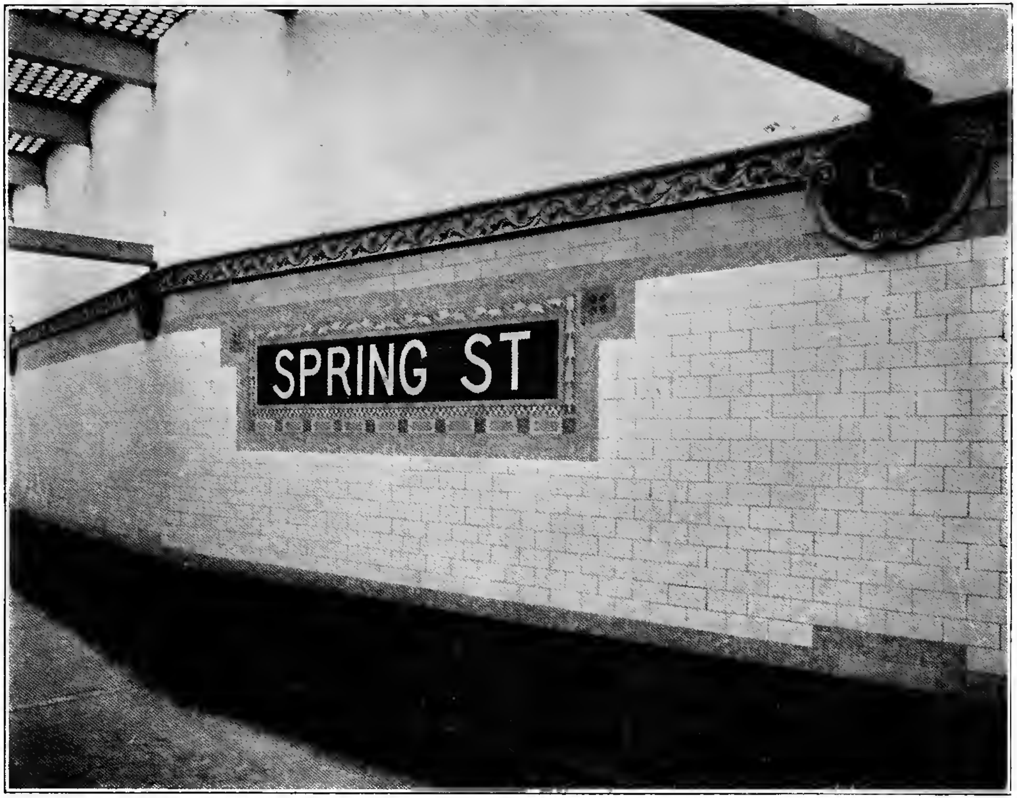
From an operating point of view the stations have been designed in two general classes, local and express stations, as the subway has been designed to provide the double service for trains running at high speed and making stops at long intervals, and trains making less rapid speed and stopping at more frequent intervals. This is accomplished by constructing four tracks from the Post Office to Ninety-sixth street, with two and three tracks in places above that point on both the east and west side lines. The express stations are the Brooklyn Bridge, Fourteenth street, Grand Central, Seventy-second and Ninety-sixth streets, at which stations all trains will stop. These stops have been located about one and one-half miles apart. The other stations located at intermediate points, at intervals of one-quarter mile, will serve only the local trains, the express trains passing through them without stopping. The plans illustrating these two classes of stations are appended to the report. The platforms to all local stations south of Ninety-sixth street are 200 feet long; the platforms to the express stations are 350 feet long, it being expected that the local trains will be short trains running at the smallest possible intervening interval, while the express trains will be longer trains, but which, on account of the higher speed, will require a somewhat greater interval between the trains. Above Ninety-sixth street the stations will have their platforms of the longer length. Local stations usually have separate platforms, from which the passengers enter or leave the north or south-bound trains. These platforms are located at the outside of the tracks, and in most cases with no provision for crossing from one platform to the other. At two stations, however, Astor place and Forty-second street and Broadway, an underground passageway has been provided, and at five others, One Hundred and Third, Columbia University, One Hundred and Sixty-eighth, One Hundred and

Eighty-first, and Mott avenue, there are bridges beneath the surface of the street but over the tracks.

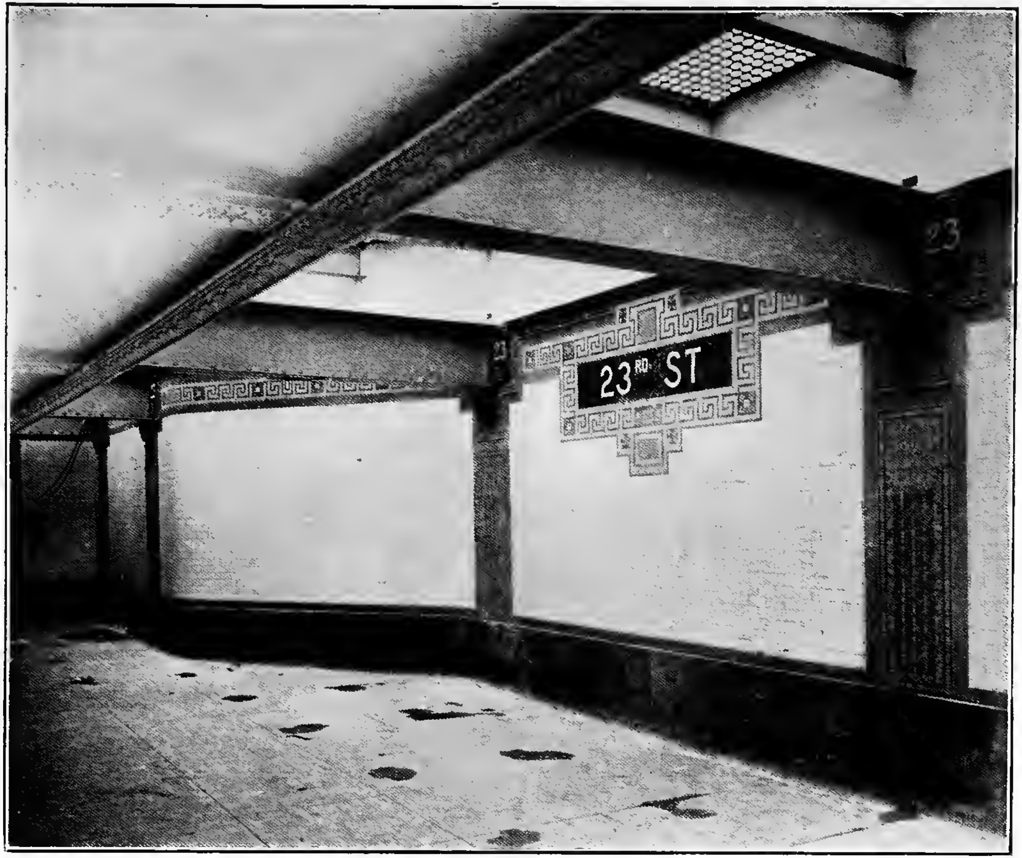
In plan there are five types of local stations. The first type covers the stations from Fiftieth street south. This type of station has two platforms, one on each side of the street, and made ot as great a width as the width of the street will permit, extending from the side of the tracks to the area line of building, which is 5 feet distant from the building line. These platforms are arranged, so far as possible, symmetrically on either side of the cross street where the station is located, a portion of the cross street being excavated to accommodate the waiting room, in which the ticket office, toilet rooms and service closets are located. In order to provide the fullest possible facilities for reaching the station, each one of these stations is furnished with eight stairways, four for each platform located in pairs on the north and south side of the cross street. Of these pairs of stairways one is an entrance stairway and the other an exit, so that, as far as possible, the incoming and outgoing passengers will be separated.

The entrance stairway descends from the sidewalk and reaches the rear of the waiting room where the ticket office is located. The passenger, therefore, descends the stairway, buys his ticket and goes forward to the platform, moving always in a straight line without reversing his direction. The exit stairways lead from the back of the main platform directly to the sidewalk, in evidence to passengers alighting from trains. Passengers will leave by these exit stairways without approaching the ticket office or meeting the incoming line of traffic. This stairway accommodation is vastly in excess of any similar accommodation provided for in any station of the elevated railway, the staircases being more numerous, wider and shorter, and with the inlets and exits separated.

The second type, as represented by the local stations, is on Broadway north of Sixtieth street. In this part of the city, Broadway is very wide and the platforms do not come beneath the sidewalks. As the congestion will not be as great as it is in the commercial districts the platforms are reached by one wide



Side Wall Treatment, Spring Street Station



SIDE WALL, CEILING AND VAULT LIGHTS, TWENTY-THIRD STREET STATION.

staircase. As traffic develops, however, these stairways can readily be doubled.

The third type of station is on Lenox avenue from One Hundred and Sixteenth to One Hundred and Thirty-fifth streets, inclusive. Along this portion of the railway, the axis of the tracks is not coincident with the centre line of the street; so that the west platform is beneath the sidewalk, while the east platform is beneath the roadway. As these stations are in the commercial districts of Harlem, more stairways have been provided than for the stations on upper Broadway, each platform being provided at the outset with two wide stairways.

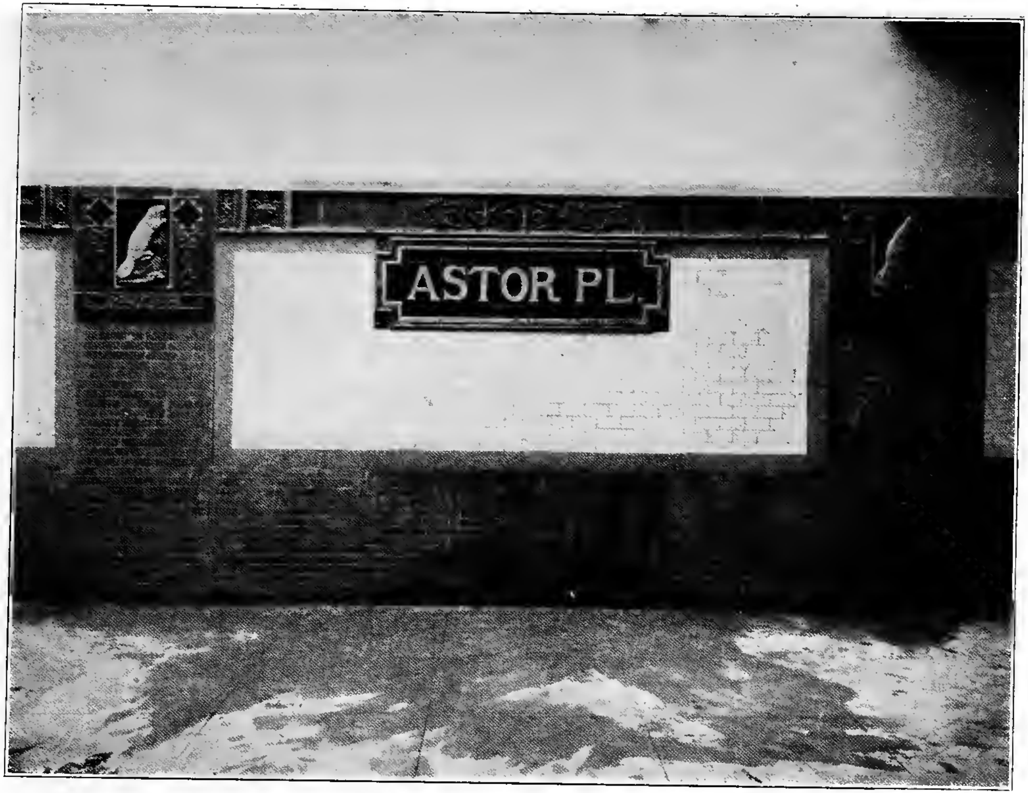
The fourth type, the deep tunnel stations, is at One Hundred and Sixty-eighth street, One Hundred and Eighty-first street, and at Mott avenue. These stations consist of a wide arch spanning both the tracks and the two platforms, access to the platforms being had by shafts, 98, 120 and 46 feet deep, respectively. These shafts contain two elevators and a stairway, the elevators having a capacity of 3,500 passengers per hour. The waiting room containing the ticket office is to be constructed immediately beneath the sidewalk, to which a short staircase descends. From this waiting room the elevators descend to a bridge crossing the tracks so that access can be had from this overhead passageway to either platform.

The fifth type consists of stations of unique design, such as the City Hall station described in the last report, which is the station on the City Hall loop for local trains that terminate at that point. This station is built on a curve and located in front of the City Hall, with two stairways leading to it. Another unique type is the station at Columbia University, which is reached through an ornamental house built in one of the parkways in the centre of Broadway, the ticket office in this case being located on the surface of the street. The stairway descends from this house to a bridge spanning the tracks and leading to both the up and the down platform.

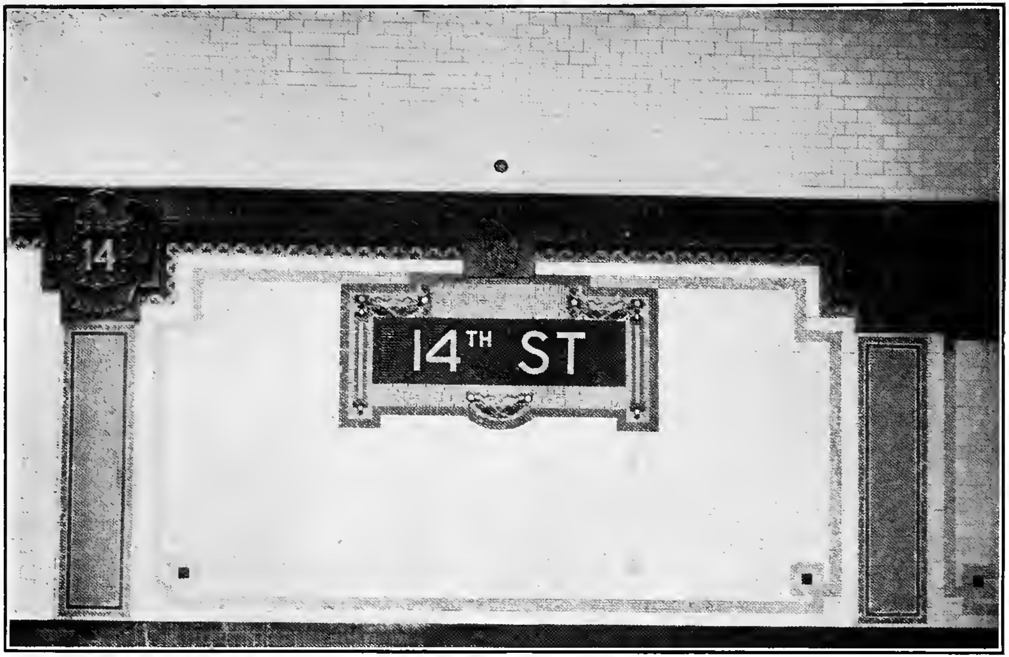
The characteristic features of the express stations are two large island platforms situated between the express and local tracks. Access to these central platforms is had at the Brooklyn Bridge, Fourteenth street and Grand Central stations, by means of overhead bridges above the tracks, but beneath the surface of the street, connecting with the waiting room arranged at the sides of the street with stairways, on the same general principle as the local stations. The island platforms of the Seventy-second street express station are reached from stairways descending directly from the parkway in the centre of Broadway, and which are covered by an ornamental house. The platforms of the Ninety-sixth street express station are reached by a passageway beneath the tracks. At these stations the island platforms will serve either the local or express trains, and passengers may use them to transfer without additional fare from one kind of train to the other.

At the Brooklyn Bridge, Fourteenth street and Ninety-sixth street stations, side platforms have been constructed in addition to the island platforms, so that at these stations passengers going to or coming from the express stations will not be obliged to go to the island platforms and come in contact with the passengers using the express trains. At the other two express stations the width of the street would not permit the construction of these additional platforms.

The stations on the viaduct portions will be covered types, the details of which have not been entirely worked out, except the station at Manhattan street on the Manhattan Valley viaduct. At this point the railway has three tracks with two platforms, one on either side. As these platforms are 55 feet above the surface of the street, it has been decided to install a double escalator or moving stairway. This escalator leads from a house in which will be located the ticket booths and waiting rooms, and leads thence to a platform directly beneath the tracks and connected with a short stairway with both platforms. The escalator can be used not only by people ascending from the street, but descending from the passageway to the street. All of the subway stations have been constructed as near the surface of the street as possible, this being the main feature of the subway design. This feature makes two things possible; it enables the stations to be supplied with natural light in the day time, and reduces the length of a stairway to the minimum. The first result was accomplished by constructing the sidewalk of



Side Wall, Astor Place Station.


14TH ST
14

glass wherever the platforms came beneath the sidewalk. Out of thirty-seven subway stations twenty are so well provided with natural light that very little artificial light will be required in them during the daylight hours. It is contemplated that this will be a very pleasing feature to the traveling public. The closeness of the platforms to the street surface requires no argument. The length of the stairway is not much more than one-half of the average stairway leading to an elevated station.

Ordinarily, lights in the stations will be furnished by means of incandescent lamps located in recesses in the ceilings. Current for these lights will be obtained from two independent sources, a regular lighting circuit and the track circuit, which latter will be used only in cases of emergency. Should, however, such an accident occur, which is hard to realize, by which both currents will fail, the glass lights over the station in the day time, or even in the night time, will prevent the stations from becoming absolutely dark. All lights are controlled from a switchboard located in the ticket booths within easy reach of the ticket seller.

In order that the stations may be dry and damp-proof, they are made to consist of an inner and outer shell. The sidewalls and ceilings of the outer shell are built of steel columns and beams with concrete filled between them, and a layer of concrete forms the foundation of the floor. Water-proofing, protected by an outer lining of masonry, envelops the whole structure. This constitutes the constructive work of the stations, as distinguished from the finishing work of the inner shell. The finishing work includes the sidewalls, ceilings and floors. The floors are all alike and are constructed of concrete, divided in plaques 3 feet square. They are 3 inches thick, made up of two layers, a foundation layer of 2 inches and a finishing layer of one inch. The latter is composed of Portland cement and white sand, leaving the floor a pleasing light gray in color. These floors are graded in such a manner, wherever possible, to drain to carefully selected points, where catch basins are located connected with the sewer. Water connections are provided in each station so that the floors can be thoroughly washed down.

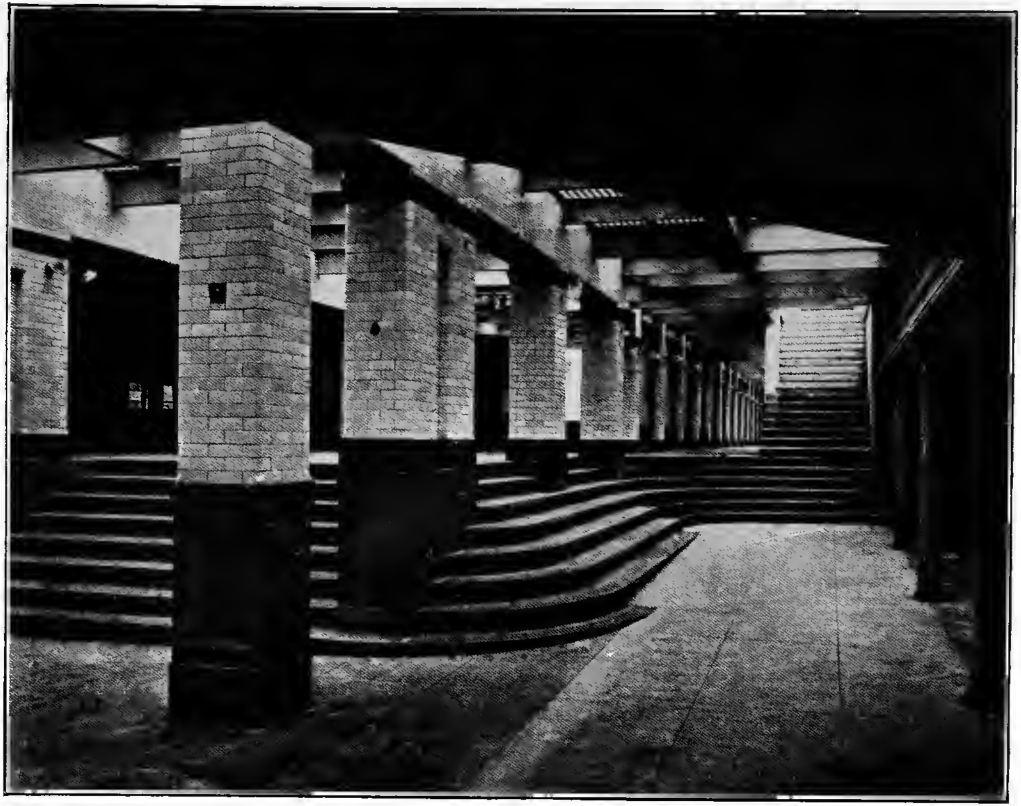
The sidewall is about 5 inches in thickness; it rests on the floor concrete and extends to the ceiling. Between it and the exterior station wall a two-inch air space is left. The base of the wall from the top of the floor for a distance of about 2½ feet is constructed of a hard buff-colored Norman brick, forming a durable wainscot and extending around the whole platform. From the top of the Norman brick a four-inch common brick wall is built up to the ceiling. This wall is set back from the face of the Norman brick to allow for a finish of glass or glazed tile. At the top of this glazed tile a cornice of faience or terra cotta is built into the wall, and at intervals of 15 feet, or opposite the platform columns, the cornice line is broken by an ornamental symbol designating the number or name of the station, and at proper intervals a large tablet consisting of a dark background of glazed mosaic carries the name or the number of the station in white mosaic in gold letters or figures. The finished floor and the sidewall are joined with a sanitary cove base, so that the corners where dust or dirt may lodge are avoided.

The architects have given very careful consideration to the decoration of the sidewalls, with most pleasing results. A separate design has been adopted for each station. The expanse of wall has given the architects an opportunity to vary these designs both in line and in color.

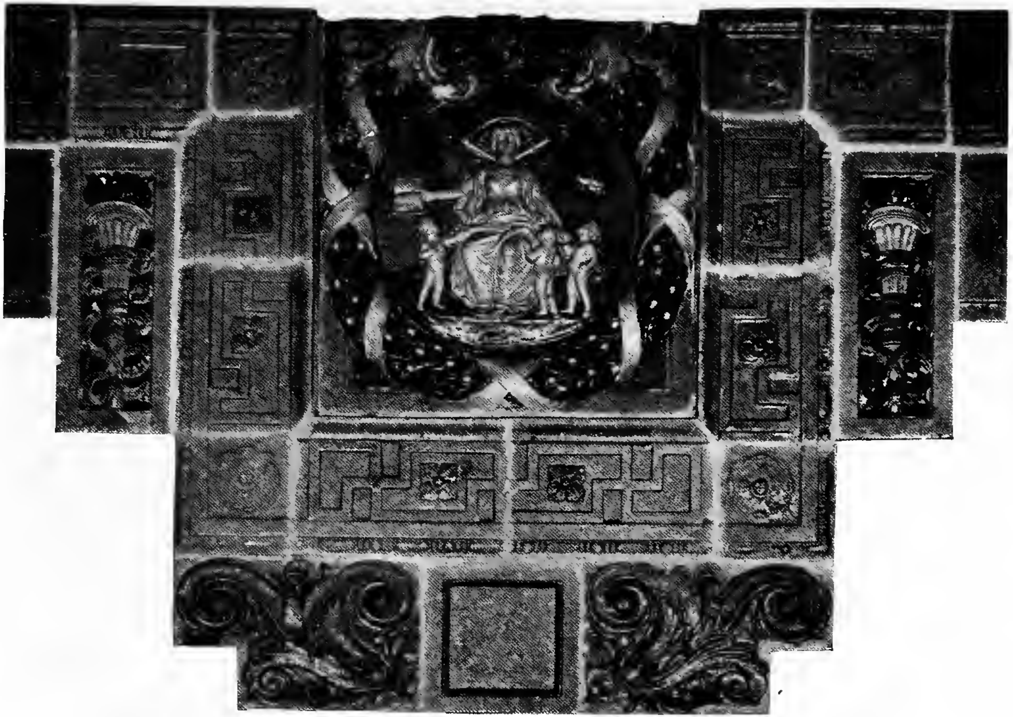
The materials used in the wall treatment between the cornice and wainscot are glass or glazed tile and ceramic-tile mosaic. The glass or glazed tile is 3 inches by 6 inches and covers most of the wall surface. The ceramic mosaic work is used to give the ornamental effects. It is made up into narrow bands of single colors, ornamental friezes, pilasters and name tablets. Under each cornice plaque there is usually a pilaster design separating the wall into panels about 15 feet long. The panels are bordered with mosaic bands and friezes. The several designs of wall treatment which have been followed are shown by accompanying illustrations.

Wherever possible the special local association has been essentially worked into the design of the station. Thus we find the Caravel at Columbus circle; the Beaver at Astor place, and the Arms of Columbia University at the Columbia University station.

Of the ceilings there are two kinds, one is a flat suspended



Twenty-Third Street Station, connecting with Building on S. W. cor. Twenty-Third Street and Fourth Avenue. Showing Corridor extending under Twenty-Third Street Sidewalk.



Columbia University Seal, in Frieze of Columbia University Station.

ceiling, which covers and conceals all the steel and concrete in the roof of the structure; the other is arched and is also suspended, but only between the roof beams, the flanges of all beams and girders remaining exposed. Both provide at least a two-inch air space between the head of the ceiling and the concrete of the roof. This affords space for the circulation of air and reduces the amount of condensation on the surface of the ceiling. For the flat ceiling one-inch channel irons, 12 inches apart and fastened with clips to the flanges of the beams and girders, support galvanized iron wire-lath. A plaster ceiling is spread upon the lath, which is one inch in thickness and consists of three coats, the finishing coat being of Keene cement. Wide ornamental mouldings running from column to column separate the ceiling into panels. These panels are decorated with finer mouldings and rosettes. In the arched ceiling the channel irons are bent to form an arch and rest on top of the beam flanges. The wire-lath is fastened as before and the three coats applied. Ornamental mouldings are again used to divide the ceiling into panels.

Ample toilet room accommodations have been provided at all stations. In addition to the usual requirements of the contract in regard to toilets, the Contracting Company has, of its own motion, added two additional toilet rooms both for men and women, fitted with basin, mirror, soap dish and towel rack. All the fixtures in the toilets are of porcelain, especially designed for the subway. The pipes are exposed and easily accessible for repairs. The floors are of concrete, while the walls are finished with a red-slate wainscot 6 feet high. Above the wainscot the walls and ceiling are finished with Keene cement. The woodwork is of oak. In each room there will be a small electric fan, producing an outward movement of air through the ventilating flue. Heat is furnished by electric heaters. The stairways are constructed of concrete and twisted-steel rods. The treads and landings are covered with a lead and steel safety tread.

The ticket booths are constructed of oak with bronze window grilles and fittings. From this description and the accompanying plans and photographs it will be seen that the stations are constructed of brick, stone, concrete and tile, the only combustible material being in the wooden doors to the toilet rooms and the ticket booths. Any danger from fire is therefore impossible.

The following list gives the names of the sub-contractors employed in station work.

American Luxfer Prism Co.
Atlantic Terra Cotta Co.
Blanchite Process Paint Co.
Alfred Boote Co.
Byrne & Murphy.
Dowd & Maslen.
Empire City Marble Co.
Grueby Faience Co.
R. Guastavino Co.
Hecla Iron Works.
Howden Tile Co.
J. E. Laheney Co.
Manhattan Glass Tile Co.
John H. Parry.
Rookwood Pottery Co.
Russell & Erwin Mfg. Co.
John Simmons Co.
Charles Smithson.
Tracy Plumbing Co.
Tucker & Vinton, Inc.
Turner Construction Co.
Vulcanite Paving Co.
J. Odell Whitenack.

Mr. D. L. Turner has been Assistant Engineer in charge of the construction of these stations and the intricate details connected therewith.

In connection with the stations an interesting feature has arisen. The owners of some of the property adjacent to station stairways have realized that buildings can be connected with the stations, the platforms of which are usually at the basement level, so that the tenants of the buildings can have direct access to the station without going to the street. In some cases this idea has been carried still further, and the owners of the buildings have rearranged the basement floor so as to afford the public a passageway from the station through the building, and have constructed shop and show windows at the basement level facing the station platform. Applications for such connections have already been made for the stations at Worth street, Astor place, Fourteenth street, Eighteenth street, Twenty-third street, Grand Central, Forty-second street and Park avenue, and Forty-second street and Broadway; and on contract No. 2, at Fulton and Dey, Rector and Wall streets, and Hoyt street in Brooklyn.

During the year the Chief Engineer was directed to prepare general plans for the development of other lines in the city at large, including all the boroughs. On February 19, he reported to the Board a general scheme for the development of the underground railways and the increase of the carrying capacity of the present railways in the boroughs of Manhattan and The Bronx, and on March 12 made a similar report for the boroughs of Brooklyn and Queens. On March 19, the Chief Engineer also reported on an additional east side line for Manhattan and The Bronx. Following is the full text of these reports, and appended are copies of the maps accompanying the reports:

1.—Boroughs of Manhattan and The Bronx.

New York, February 19, 1903.

Hon. A. E. Orr, *President,* Rapid Transit Board:

Sir—It is with great satisfaction that I now find myself able, in obedience to the resolution adopted by the Board, to propose a general solution of the rapid transit problem in the greater New York. The present report will deal with Manhattan and the Bronx boroughs, and a later report, soon to follow, will deal with Brooklyn. The plan to be submitted accords with the general and far-seeing program which the present Board entertained from the very time of its organization in 1894, and toward the completion of which its efforts have, in spite of many difficulties and obstructions, tended as rapidly as the means at the disposal of the Board have made possible.

Upon originally proposing the Broadway route, later in the negotations with the owners of the Elevated and New York Central and Hudson River Railroads, and still later in adopting the routes of the present Manhattan-Bronx Railroad, it was the intention of the Board that whatever work the means then at hand made possible should be done with relation to a larger and really comprehensive plan. The inability of the Board to carry out such larger intention has been represented by the delay of work which must now be taken up, and taken up under disadvantages from which its earlier performance would have been free. The partial or even preliminary character of the routes of both the Manhattan-Bronx and the Brooklyn-Manhattan Railroads now under construction was recognized from the beginning, and was often and publicly stated by the Board. The pecuniary limitations to which the Board was held by the debt limit of the city, or by the judgment of its executive and financial heads, or by determinations of the Supreme Court, had, for years before the Board adopted the resolution in obedience to which this report is submitted, made it premature to propose a general plan commensurate with the rapid transit necessities of the city. My present report is a proposal to complete the program to which the present Board and myself (if I may say so as its Chief Engineer), have been dedicated for upward of eight years.

Immediately after the adoption of the resolution directing this report to be made the Pennsylvania and the New York Central Railroads and the New York and New Jersey Tunnel Companies began to submit plans for the construction of new lines and the expansion of old ones. As these plans entailed innovations in the handling and distribution of the great influx of surburban travel, it was deemed wise to wait until such plans were finally settled before presenting a scheme for the expansion of the local systems, in order that all might be made to harmonize and to avoid inconvenient breaks or unnecessary and expensive readjustment. The above-mentioned plans are now fixed, giving the Pennsylvania Railroad a great terminus between Seventh and Ninth avenues and Thirty-first and Thirty-third streets; the New York Central a largely increased terminus at Forty-second street, thus permanently establishing that point as a centre of through passenger travel, and the New York and Jersey Tunnel a station at Greenwich and Christopher streets.

Tremendous increase in passenger travel on all lines during the past year clearly indicates that when the present subway system now under construction from Brooklyn to The Bronx is completed that it will almost be immediately congested, so that no great amount of permanent relief can be counted on. In order to meet the growing and imperative demands for increased facilities, arising from the natural growth of our city, it is evident that new lines should now be laid down and put under construction as soon as possible, and that steps should be taken to improve the existing facilities so as to permit them to carry the increased burden during the time when the new lines are being constructed.

The tenor of your resolution is that such a plan be prepared for the whole city, and it was my intention to submit such a plan in its entirety. The question is, however, so great and broad, with details so complex, that with the consent of the Board, I will submit the plan in two parts, one covering the boroughs of Manhattan, The Bronx and Queens, the other, Brooklyn and Richmond. In this way the details can be studied separately by the Board, and, if approved, can be suitably united and submitted as a whole to the municipal authorities.

The scope and extent of the present subway system were unfortunately limited by a decision of the courts and the financial position of the city, so that the Board was compelled to lay out one line to serve both the east and west sides of the city. This attempt necessarily involved a certain sacrifice in directness, which directness is essential for quick time. This defect should now be removed by extending the subway south from Forty-second street along Broadway, and north from Forty-second street at Park avenue.

When the bids for the Brooklyn extension were opened, it will be recollected that Mr. Belmont, as President of the Rapid Transit Subway Construction Company, offered to build a line from Forty-second street to Fourteenth street at considerably below the estimated cost. Such a line would, however, but transfer the point of congestion from Forty-second street to Fourteenth street, and I, therefore, propose that this line be extended to the lower end of Manhattan Island at South Ferry, following University place, Wooster and Church streets, and thus furnish two additional tracks south of the Post Office. From this line at Broadway a subway under Thirty-second street to Seventh avenue should be built so as to bring the new Pennsylvania terminus to a connection with the subway and elevated railway for the purpose of local distribution of passengers. In like manner, I propose to make a junction, as our general plan originally contemplated, at about Fortieth street and Park avenue, and carry the new line, with three tracks, beneath the Grand Central Station to Lexington avenue, and then along and under that thoroughfare to The Bronx, making a connection with the New York Central and New Haven Railroads at Mott Haven. Although the line passes beneath the yard of the New York Central between Forty-second and Forty-fifth streets, property not subject to condemnation, nevertheless, I believe that satisfactory arrangements can be made for the easement. A branch from this line can be carried westward under One Hundred and Tenth street to Lenox avenue, thus providing a connection between the east and west lines north of Central Park, as the Forty-second street subway line provides one south of the Park. On the extreme easterly end, the line in The Bronx should be extended from West Farms along the east side of Bronx Park, unless the Park authorities prefer a direct route through the Park, in order to reach Wakefield and Mount Vernon, two rapidly growing sections of the city, now without rapid transit facilities. A branch should also be laid out continuing along the Southern Boulevard, and then westerly on One Hundred and Eightieth street, thus reaching a section of The Bronx not served by any line. A connection between the Bronx Park line and the Manhattan Elevated should also be made from Brook avenue along Westchester avenue to Third avenue.

The additional lines, and especially those in the subway, will require some years to complete, and during this time it is absolutely essential that immediate relief measures be provided. For reasons, not necessary to discuss, the Manhattan Elevated Railway Company has never accepted former suggestions of the Board to provide such additional facilities as the Board deemed advisable. Recently, however, the management of this property has passed under the control of the Interborough Rapid Transit Company, and I am imformed by Mr. Belmont that he will gladly and liberally meet the views of the Board and extend the Manhattan lines, and so connect them with the subway system that both systems may be operated as a unit, with through trains at a single fare. Such arrangement would at once confer a great benefit upon the local traveling public, as presenting the quickest means of securing immediate relief.

To this end I suggest the following alterations in the Manhattan structure and method of operation:

Second Avenue Division—Add two tracks from the Harlem river to Chatham Square, carrying the two new tracks over the Chatham Square junction and over the Park Row line to City Hall.

Third Avenue Division—Extend the third track from Fifty-ninth street to Ninth street, so as to make it continuous from the Harlem river to the latter point.

Suburban Division—Add a third track from south of the Harlem river to Winchester avenue.

When these lines are completed a rearrangement in operation can be made advantageously. The Third Avenue division is the main system for local business on the east side. To-day this local business is greatly interfered with by running the Bronx trains over the same structure, and in like manner the Bronx facilities are much restricted by the impossibility of running more trains over the Third avenue structure. By converting the Second avenue division into a four-track structure, and by extending it to the City Hall, an immeasurably better service will at once be provided for the east side of the city. Bronx passengers will then be carried direct on a continuously running express structure, while local passengers from points south of the Harlem will be carried by trains stopping at or starting from the river, and thus not come in contact with the through passengers. In like manner, by connecting the Rapid Transit Westchester avenue line with the Suburban line at One Hundred and Forty-ninth street, through trains can be run from points south of Bronx Park, or Wakefield, or Mt. Vernon, by a direct line to all points south of the Harlem river, including South Ferry and City Hall, in through trains for a single fare. This would save passengers from the northeastern portion of The Bronx one and three-quarter miles of their journey, which would otherwise be involved if they were carried to the west side of the city and back by the present subway. The saving in time would be even greater than the mileage would indicate, as the express service for such passengers would begin at One Hundred and Forty-ninth street and Third avenue, instead of at One Hundred and Tenth street and Lenox avenue. The subway proper would then begin at One Hundred and Forty-ninth street and Third avenue, and furnish the people living in the centre of The Bronx with fresh trains, transfers to which could be given at One Hundred and Forty-ninth street for the small proportion of travel that might desire to go from Bronx Park to the west side of Central Park. This would also permit the present Lenox avenue line to become what it should be, namely, a line for purely local Harlem travel, so that the residents of the Harlem district would be sure of finding seats.

Sixth Avenue Division—In order to furnish special trains for the retail shopping district lying north of Fourteenth street, and in order to furnish a connection to the terminus of the New York and Jersey tunnel at Greenwich and Christopher streets, I would propose an extension of the Sixth avenue division along Christopher street to Greenwich street, connecting with the Sixth avenue division at the north end of the Eighth street station, and thence lay a third track on the Sixth avenue structure northward. By this means many north-bound trains could run "local" through the wholesale dry goods district, as a gathering ground, and having become filled by the time they reach Eighth street, could then pass on to the third track and run "express" to Harlem. The relief thus provided to the local track north of Eighth street would permit trains to start from Christopher street and run "local" through the retail district.

Ninth Avenue Division—I recommend:

(1) The extension of the third track from Fourteenth street south to Cortlandt street, so that the express service may begin from the latter point.

(2) A branch from the main structure at Fifty-third street, running westerly along Fifty-third street to Tenth avenue, northerly along Tenth avenue to Fifty-fifth street, where, owing to the topography, the elevated structure can be depressed into the subway and so carried under Amsterdam avenue to a connection with the subway at Seventy-second street. This connection can be built rapidly, and would serve in connection with the third track extension to Cortlandt street, as an immediate means of carrying the traffic assembling in the upper limits of the subway direct to South Ferry, thus giving some measure of relief pending the completion of the subway to the same point.

(3) The extension of the third track from One Hundred and Sixteenth street north to One Hundred and Fifty-fifth street,

making a continuous third track from Cortlandt street to the Harlem river.

(4) Make an arrangement with the Putnam Division of the New York Central Railroad by which the present bridge across the Harlem river can be reconstructed into a three-track structure, and then extend the Eighth avenue line across the Harlem river, with three tracks and by a short tunnel through the high ground on the east bank of the Harlem river to Jerome avenue. thence northerly along Jerome avenue to Woodlawn, and thence westerly in the neighborhood of Mosholu avenue to a connection with the Putnam Division in Van Cortlandt Park. This line will furnish, in the quickest and most direct manner, good service for what constitutes the largest inhabitable area of the old city of New York which is to-day without rapid transit facilities, When the construction of the Lenox avenue and Broadway lines south from the Harlem river is completed, the Eighth avenue elevated will be relieved of a large amout of local travel, thus permitting the additional burden of the Jerome avenue extension to be successfully carried.

The railroads now terminating at the Grand Central station, supply transportation facilities to various parts of the northerly district of the city, and also to the suburban districts lying immediately north of the city, the residents of which come daily to New York for the transaction of business. At present these passengers are discharged at Forty-second street, and have to find their way to the lower part of the city of Brooklyn by other lines, the transfer involving serious delay. It is obvious that the proper method of handling such traffic is by direct means in through trains. If the consent of the above-mentioned railroads can be had, connections should be made at as many points as possible with the subway and elevated lines. The points where such connections can be made are with the Suburban elevated at Fordham; with the proposed Jerome avenue extension at Van Cortlandt Park; with the subway at Kingsbridge; with the Manhattan Elevated at One Hundred and Fifty-fifth street, to both the main line and the Putnam Division of the New York Central, with the subway to the New York Central, at the Harlem Ship Canal; with the Lexington avenue subway to the New York Central, Harlem and New York and New Haven Railroads, at Mott Haven; and all so arranged that local trains from nearby suburban points can be run direct over the rapid transit lines, and thus avoid the congestion at the Grand Central station or the delay in transferring from one railway to another. In addition to this, however, the New York Central Railroad Company now owns the railway along its own right of way, from Spuyten Duyvil to Fifty-ninth street, and thence on the surface of Eleventh, Tenth, and other avenues and streets south to Houston and Beach streets. This line might easily be converted into a passenger line and furnish a great measure of rapid transit relief. The existence of the tracks on the street surface south of Fifty-ninth street is a great public burden, and should be removed if possible. I would suggest that negotiations be taken up with this company looking to the removal of these surface tracks, and substituting in place thereof an elevated structure along the same route or possibly along West street, and which, if constructed so far south as Beach street, might be continued south to Battery place, and so provide not only a freight, but also a passenger line along the water front. If this were done, the line should be constructed with four tracks south of Fifty-ninth street, with the passenger tracks elevated above that point.

In regard to the borough of Queens, the city is now constructing a bridge from the foot of Sixty-fourth street across Blackwell's Island, which will be completed in the course of two or three years. When this is done I suggest that a branch of the Second avenue elevated be constructed along Sixty-fourth street and over the bridge, to Long Island, and that a plaza be then arranged, permitting the present surface lines now plying throughout that district to approach and deliver their passengers to the elevated, by which they can be carried by an express and local service to any point north or south in Manhattan, Brooklyn or The Bronx. At present the development of Long Island City and Queens is not sufficiently concentrated to warrant the expensive construction of special rapid transit lines. The line, however, as proposed above, can be extended in the future as soon as the necessary demand arises and along such route as may then be determined.

Upon the map accompanying this report is indicated in appropriate colors the subway and Manhattan systems as now constructed, or being constructed, and the additions and extensions of each as proposed, and also the line of the New York Central along the water front. The plan proposed in this report not only extends the subway, but makes it an evenly-balanced system, with separate east and west side lines, and with intercommunication between such lines. If the Board should carry out these suggestions, the city will own a railway system complete in itself, covering thirty-seven and one-half miles in the boroughs of Manhattan and The Bronx, with one hundred miles of track, exclusive of side tracks. On the other hand, the plan proposes to afford the greatest measure of immediate relief by the only way in which such relief can be afforded, that is, by the expansion of existing facilities. Such expansion would be obtained by the use of private capital without encroaching on the debt-incurring capacity of the city, but under such proper terms as would be laid down by the Board. In like manner, the plan contemplates increasing the opportunities of those persons who live along or beyond the extreme northern limits of the city to reach their places of business and work, by direct lines and in much reduced time.

The equivalent amount of single track above mentioned is about one hundred and thirty miles, and the expense of construction, liberally estimated, is between $45,000,000 and $50,000,000, about one-half of which will fall on the city.

All of these lines herein suggested should, if approved by the Board, be placed under construction as soon as the necessary consents can be obtained, and the terms of the contract drawn up; and it is hoped that they will be sufficient to provide for the boroughs of Manahattan and The Bronx for some years to come.

In regard to the great and growing borough of Brooklyn, a similar plan should be carried out, of adding new lines where such new lines are needed to reach territories not now served; to expand existing lines where the present service is inadequate; and, above all, to better utilize present means of communication between Brooklyn and Manhattan, to provide new and better means, and also to furninsh to residents in Brooklyn facilities for distribution in Manhattan, and to avoid the terrible congestion now existing at a single point. Such a plan is obviously large, and so large, it seems to me, that it warrants consideration by your Board on its own merits, and free from possible complications if it is taken up in connection with the plans for Manhattan and The Bronx. This plan will necessarily deal with the problem of connecting in Manhattan the various bridges and tunnels going from Brooklyn to Manhattan. As soon. therefore, as the Board has examined the plans covered by this report, another plan, equally comprehensive, it is hoped, will be laid before you covering the borough of Brooklyn.

Respectfully submitted,

WM. BARCLAY PARSONS, *Chief Engineer.*

2.—BOROUGHS OF BROOKLYN AND QUEENS.

NEW YORK, March 12, 1903.

HON. A. E. ORR, *President,* Rapid Transit Board:

Sir—On February 19 I laid before the Board a plan for extending the existing rapid transit facilties of the boroughs of Manhattan and The Bronx, and for creating new facilities where there seemed to be greatest immediate demand, and at the same time explained to the Board that I would, within three weeks, submit another plan covering the borough of Brooklyn, as the latter could be more intelligently treated if considered on its own merits. Such a plan I now beg leave to submit for your consideration. When the two plans and their accompanying reports are combined the instructions of the Board directing the Chief Engineer to prepare a comprehensive plan of rapid transit extension for the whole city of New York will have been complied with.

When the Rapid Transit Board was organized its jurisdiction extended over the city of New York, as it then existed, a territory now included within what is the boroughs of Manhattan and The Bronx, and it was not until the limits of the city were extended so as to include the city of Brooklyn, Richmond County and a part of Queens County, that the Board had any power to deal with the last-named territories. It is for this reason that the work of the Board is found to be in a more advanced condition in Manhattan. As soon as possible after consolidation was effected the Board took up the question of extending the subway system across the East river, and pushed forward as rapidly as possible the work of preparing plans and securing the necessary consents. In due course a most advantageous contract was let, and such work is now actually in progress. When this second contract is completed the municipality will own a subway system extending from the borough of The Bronx, passing the whole length of Manhattan to the intersection of Flatbush and Atlantic avenues in Brooklyn, with a total length of railway of 24.1 miles, over which passengers can ride in through cars for a uniform fare of five cents, and with both express and local service over the greater portion of the route.

Owing to the fact that until recently the municipalities of New York and Brooklyn were quite separate, there had been developed in the two cities two distinct systems of transportation facilities without any correlation, in each case as if the other city did not exist, and as if neither city had any relation with the other. In consequence we have the great network of railway lines of Brooklyn, consisting of 30 miles of elevated railway and 479 miles of surface railway (the latter expressed as single track) focused to one bridge with one pair of tracks for elevated trains and one pair of tracks for surface cars. These four tracks carry annually about 110,000,000 passengers, the greatest burden of traffic carried by any railway in the world. This extraordinary condition produces not only a congestion at the Manhattan terminus of the bridge that is a disgrace to municipal management and modern technical skill, but it also inflicts on the great majority of the passengers a tremendous burden of inconvenience in depositing them at a point considerably remote from their points of ultimate destination. However important a centre may be the City Hall, it is evident that only a small portion of the people coming from Brooklyn have their places of business in that immediate vicinity, the others being obliged to go by foot or vehicle to other points in the wholesale and financial districts extending from, say, Bowling Green to Grand street.

In considering any plan for the relief of Brooklyn—for however great is the need of relief from the present lack of transit facilities in Manhattan, similar relief for Brooklyn is quite as pressing—the question of congestion at the Manhattan terminus of the Brooklyn Bridge stands pre-eminent. The capacity of the bridge and the choking of the avenues leading to it in Brooklyn limit the capacity of all lines in Brooklyn. With increased capacity of outlet every elevated and surface track could immediately carry more trains or cars.

To afford such relief certain improvements are in hand, and some nearing completion. The subway system is already being extended as above explained; the Williamsburg bridge is nearly finished, and the Manhattan bridge is well begun. When these works are completed by the city, at a tremendous cost, the opportunities will be presented to materially improve the situation. In order that such improvement shall be thoroughy effective some plan must be devised to bring the new bridges into harmonious relation with the transportation facilities. Such a plan has not hitherto been devised.

Many plans have been proposed for improving the conditions existing on the Brooklyn bridge, but no entirely satisfactory plan has ever been devised, for the reason that no plan has ever been proposed sufficiently drastic or comprehensive as to provide a definite solution. Every plan has included some makeshift alteration of the bridge. As originally designed, twenty-five years ago, the bridge was intended to carry one pair of tracks in the centre, on which trains were to be run to and fro across the bridge, with an estimated capacity of 30,000,000 passengers annually, a figure not realized for many years. After a time the inconvenience of changing cars at the Brooklyn end, and the burden of paying two fares, led the city authorities, very wisely, from the point of view of the public, to lease the bridge railway to the local railway company, thus permitting it to run its elevated trains direct to the Manhattan terminus, and to place tracks on the bridge roadways for the surface trolley cars. These roadways, wide enough for vehicular traffic, if given up wholly to that purpose as originally planned, are seriously overburdened with both cars and vehicles; as the former, being on fixed lines, necessarily impede, and are impeded by the latter. To obviate this last difficulty it has been proposed to reconstruct the bridge superstructure at a cost to the city of more than $2,000,000. The bridge is now carrying nearly four times as many railway passengers as the original utmost maximum estimated capacity, with a similarly increased vehicular traffic. It is simply impossible for the present structure to perform this service properly.

One plan that has been proposed for bridge relief took into account one of the great defects, namely, the congestion at the bridge end, to relieve which it was thought necessary to build distributing railways north and south. This was the plan recommended by Messrs. Grout, Boller and Whinnery. The railway extensions proposed were elevated, however, thus inviting hostile attack by abutting property owners; and they also failed to recognize the limitations of the bridge itself.

Inasmuch as the most important details in the solution of the Brooklyn problem are the utilization of the bridges and distribution instead of congestion in Manhattan, they should be given first place in the consideration of the question. As more people can be carried in train units than in car units the facilities for distributing people by the Brooklyn elevated trains should be developed as much as possible, and arrangements made to utilize both the Williamsburg and Manhattan bridges, the western termini of which, however, are too far away from the great commercial centres to be reached conveniently without special transportation lines. After a very careful study of the Brooklyn bridge, and after studying all the plans already proposed and making many others, I am convinced that it should be restored to its original purpose and cease to be a factor in the handling of elevated trains. As it can only be made use of by some makeshift plan, it is better to face the problem with all its difficulties and create a new plan adapted to the requirements of to-day.

To this end I beg leave to propose the following:

In connection with the Brooklyn end of the Manhattan bridge, the city authorities propose to construct a new thoroughfare along the axis of the bridge produced to the intersection of Fulton street and Flatbush avenue. Such a street intersects or reaches all the elevated lines now running to the Brooklyn bridge. When the Manhattan bridge is completed spurs from the elevated lines will be run over the bridge. The topography of the ground in Brooklyn is such that a connection can also be made with every elevated line so that it will run into a subway without serious interference with cross streets. Such a subway can be carried under Nassau and Orange streets and the East river to Maiden lane in Manhattan with a station near William street. From this station one line can run across the city via Cortlandt street to West street, and another line along William street, diagonally under the present bridge structure to Park row, thence to Centre street, to Grand street, and then under private property to the end of the Williamsburg bridge at Delancey street, where, with but little alteration in the bridge structure, the subway tracks can be connected with the elevated tracks on the bridge. This will provide a loop for the elevated railways of Brooklyn by way of the Williamsburg bridge and this second Brooklyn tunnel. With this subway a similar connection can be made with the elevated tracks on the Manhattan bridge when the latter is completed, thus providing a second loop. This subway should have two tracks everywhere, except along Centre street, where there should be four. Stations could be located at William street, Fulton street, Brooklyn Bridge, Worth street, Canal street and Grand street, and at Church street and West street on the Hudson River branch. As the delays due to cross-switching at the terminal would be done away with, more elevated trains and longer ones could be run through the tunnel than on the present bridge, and by providing the above-named stations, or others equally convenient, Brooklyn travelers would be delivered at six stations instead of one as at present, and be distributed along the whole length of the east side of the commercial district in through trains at a single fare (also at two stations on the west side). For such passengers as desire to go to points north of Delancey street one or other of the two lines connects with every transportation line in Manhattan. The gradients in the tunnel are distinctly less than those on the Brooklyn bridge. This plan propeses circulation of movement between the two new bridges and the proposed tunnel.

When the elevated trains are removed from the Brooklyn bridge the trolley cars can be transferred from the roadways to the original bridge tracks, and thus restore the roadways to the exclusive use of vehicles. Additional terminal loops for the trolley cars have been ordered for the Manhattan end of the bridge. When they are completed the terminal congestion will be greatly reduced, and when the cars themslves are freed from vehicle interference, a more rapid and better service in every way can be furnished by the railway company. The city also will be saved the expense of reconstructing the bridge superstructure. As an incident to this plan, but an incident of no small importance, it will be possible to remove the existing unsightly bridge head-house and give a magnificent vista to the bridge tower from City Hall Park, an opportunity made possible because the old Hall of Records has been removed.

To complete the subways from Williamsburg bridge to Maiden lane will require about two years after the necessary consents are obtained and contracts let, and three years will be required to complete the East River tunnel. It is hoped that the Williamsburg bridge will be opened for traffic during the present year. Some temporary arrangement must therefore be made to utilize the opportunity for additional service thus offered. This can be done by extending the elevated tracks over the Second and Third Avenue Elevated lines along Delancey street to the Bowery, and thence along the contemplated continuation of Delancey street to Elm street, thus making a connection for transfer to both the east side elevated lines and the subway, and bringing the terminus of the Brooklyn lines near the centre of commercial activity. A very much better temporary relief would be to avail, if possible, of a suggestion made in my report of February 19, wherein two additional tracks were proposed over the Second Avenue Division to City Hall. These tracks could be connected with the Williamsburg bridge by a line only 1500 feet long, and a temporary connection could also be made with such new tracks at the Brooklyn bridge. A continuous loop would thus be immediately realized. It is possible that such an arrangement could be made with the two companies if it were taken up by the Board in connection with the granting of the other extensions previously and herein recommended. This connection should continue only so long as would be required to complete the Centre street subway.

The whole of the tunnel and subway herein proposed from the Brooklyn approach to the Manhattan bridge under the East river and connecting with the Manhattan termini of the Williamsburg and Manhattan bridges, could be constructed under the conditions of municipal ownership, as provided in the Rapid Transit Act, and similar to those in force on the subway and tunnel now being built to Brooklyn.

Should the above-described plan be carried out, the borough of Brooklyn will then be connected with the borough of Manhattan by three bridges carrying six elevated tracks, and ten surface tracks, and two tunnels carrying four tracks, every one of which tracks will have a greater carrying capacity than either one of the two elevated or two surface tracks on the existing bridge. These increased facilities of transfluvial transit will in themselves provide the greatest single measure of relief that Brooklyn stands in need of; there remains, therefore, but to propose and to carry into execution as rapidly as possible certain extensions of the rapid transit facilities in Brooklyn, which will be rendered possible by the increase in the terminal facilities in

Manhattan. These extensions should obviously be of two characters—one, the extension of the subway system wherever such extensions can be made economically, and become an integral part of the railway system which the city has already begun; the other, extensions on such terms as the Board may determine of the elevated lines of the Brooklyn Rapid Transit Company, in order that such company may more properly fulfill its obligations. The first of these extensions will obviously require time; the second, however, can be more quickly executed, and consequently is the one to furnish immediate relief. Such extensions as seem to be most important are shown upon the map accompanying this report and can be described briefly as follows:

FIRST—SUBWAY SYSTEM.

This system now terminates according to Contract No. 2 at the intersection of Flatbush and Atlantic avenues, where a connection can be made by transfer or otherwise with the trains of the Long Island Railroad, and by means of the Atlantic avenue improvement, now in progress of construction jointly by the City and the Long Island Railroad, and so provide means of reaching the easterly limits of the borough of Brooklyn. From the present terminus the subway system should be extended under Flatbush avenue with four tracks to the Prospect Park Plaza. Around the outer limits of the Plaza I propose a loop, and diverging from this loop, a three-track line easterly along the Eastern Parkway to, say, East New York avenue. Two of the tracks on Flatbush avenue should be depressed at the Plaza, passing beneath the loop as to avoid grade crossing, and then be carried southerly along Flatbush avenue to, say, East Broadway. These two lines would reach a portion of the borough of Brooklyn not now served by any of the elevated lines of the Brooklyn Rapid Transit Company, but a district second to no other in Brooklyn in desirability of improvement, and which in the near future, with proper facilities, will, beyond question, support a large population. The two termini that are proposed above are merely arbitrary, as reaching points beyond which the subway system could be carried in the near future when and as desired. In these di- would seem unwise, therefore, to carry the system further than the points proposed until lines of development beyond will have been formed. The railway can then be extended more intelligently and more beneficially than can be done now, when, in the absence of definite development, only lines of a purely arbitrary character can be laid down. It is interesting to point out that these proposed subways, if constructed, will connect the great park systems of the city of New York, from Bronx, Pelham and Van Cortlandt Parks on the north, passing Central Park in the middle, and reaching Prospect Park on the south.

Another extension of the subway could begin at Flatbush and Atlantic avenues, running south along Fourth avenue to Fort Hamilton, probably becoming elevated at some point where the topography would allow.

When these lines are carried into execution and the traffic that they would produce has been developed, it is obvious that some further connection will be necessary in addition to the Whitehall-Joralemon street tunnel. It would seem that the best route for such a tunnel would be Atlantic avenue to Whitehall street. Such a tunnel would permit connections being made not only with the South Brooklyn line, but the east and southeastern Brooklyn lines, besides serving an already well populated district in Brooklyn. The Atlantic avenue line could be connected with the line that I have proposed to the Board running south along Church street, provided such a line is constructed.

SECOND—BROOKLYN RAPID TRANSIT ELEVATED SYSTEM.

Studying the local details of this system one is impressed by the fact that it is without rapid transit facilities, as each one of the lines is a two-track structure only, and therefore incapable of furnishing an express service. The first thing that should be done should be to reinforce the main lines of travel with a third or a third and fourth track, so that the passengers who are living at a distance from the water front in either South or East Brooklyn can be carried to their destination without the inconvenience and loss of time of stopping at intermediate stations. Certain minor changes should be made in the system at a few points in order to facilitate the running of trains, and certain more important extensions should be made in order to reach the Williamsburg bridge, and develop the facilities offered by that structure. In addition to this there are two important districts, one wholly in Brooklyn and one partly in Brooklyn and partly in Queens, not now served by rapid transit lines. It would be a comparatively easy matter for the Brooklyn Rapid Transit Company to serve both of these districts and bring them both in touch, not only with the commercial district in Manhattan, but with the retail shopping district in the borough of Brooklyn itself. These several extensions, additions and connections are shown upon an accompanying map, and are set forth in detail in the following table:

1st. Add a third track on the Fulton street elevated from the end of the line at East New York to the Brooklyn bridge.

2d. Add a third and fourth track to the Broadway line, from the loop at East New York to the Williamsburg bridge, and a third track from the loop to the terminus at Cypress Hills.

3d. Add a third track to the Myrtle avenue line from Ridgewood to the Brooklyn bridge.

4th. Add a third track on the Fifth and Third avenue lines in South Brooklyn, from Myrtle avenue to Sixty-fifth street.

5th. Connect the Fulton street elevated, between Williams place and Alabama avenue and the Jamaica plank road. This will permit Jamaica trains to pass down either Fulton street or Broadway and avoid running through the loop with its consequent congestion.

6th. Connect the Fulton street line and the Fifth avenue line to provide for the latter a better terminal arrangement and to serve the local shopping district in Brooklyn.

7th Construct a new elevated railway from the point where the Brighton Beach Railroad connects with the Fulton street line, along Franklin avenue to Wallabout street, to Gwinnett street, to Lorimer street, to Manhattan avenue, to Vernon and Jackson avenues in Long Island City, to the Blackwell's Island bridge, with an extension through Jackson avenue to Debevoise avenue, to Flushing Bay, and also a spur from Lorimer street to Montrose avenue, to South Fifth street, to the Williamsburg bridge. This line will pass through an extensive portion of the borough of Queens, and bring it in touch with the wholesale and financial districts in Manhattan, and the retail district in Brooklyn.

8th. Extend the Fulton street elevated from its terminus at Crescent street through Fulton street, Pitkins place, private property and Stewart avenue to the Jamaica plank road. This extension will give a direct connection to the district lying east of the terminus of the Fulton street elevated and west of Jamaica.

9th. The Brooklyn Rapid Transit Company is now arranging by means of inclines to make a loop between the Third and Fifth avenue elevated lines to Fort Hamilton, which will very materialy increase the facilities at that point. It is obvious that these facilities can be but temporary only, as these lines are on the surface, and the development of that district will before long prevent the continuance of running trains in this manner. Elevated structures should therefore be authorized from Third avenue and Sixty-seventh street, through Third avenue to Clarke street, to Fifth avenue, and thence along Fifth avenue to Thirty-eighth street, thus completing the loop in question.

If the Board should approve these suggestions and should discuss with the railroad company terms under which such extensions can be authorized, I beg leave to call the attention of the Board to the fact that the Brooklyn Rapid Transit Company now owns a line partly depressed and partly on the surface connecting with the Fulton street elevated and running to Brighton and Manhattan Beaches, known as the Brighton Beach Railroad. In many places this line runs on the surface and crosses streets at grade. Although such streets are not now actually in existence, nevertheless, on account of the development of this portion of Brooklyn, which is taking place so rapidly, steps should be begun to remove the danger of these grade crossings. I therefore beg leave to suggest to the Board that one of the terms made with the company should be an arrangement that all the grade crossings on this or any similar lines should be removed.

In this report no railway provisions have been proposed to connect the borough of Richmond with the borough of Manhattan. After a very careful study of the problem, I regret to report that the great expense involved is entirely out of proportion to the population to be served.

The total number of miles of new road proposed by this report is thirty-seven, and the total amount of new tracks proposed, whether in new road or as additions to existing roads, is 120 miles. An approximate cost of these improvements, exclusive of abuttal damages, is about $52,000,000, of which about $31,000,000 represents the approximate estimated cost of extending the subway and of constructing the second tunnel with its Centre street connection in Manhattan. If the Board approves the suggestion that is contained in the report that the extensions of the subway, and the new tunnel with its connections should be undertaken as municipal construction, the latter figure will represent the cost of so doing.

Respectfully submitted,

Wm. Barclay Parsons, *Chief Engineer.*

5—ADDITIONAL EAST SIDE LINE (MANHATTAN AND THE BRONX).

New York, March 19, 1903.

Hon. A. E. Orr, *President, Rapid Transit Board:*

My Dear Sir—In accordance with instructions of the Board I have been making a study for an additional east side line, as a continuation south from Forty-fifth street, of the proposed Lexington avenue line, or as an additional line by some other route. East of Madison avenue the avenues along which it would be possible to construct a rapid transit route are: First, Second, Third, Lexington and Fourth avenues. Fourth avenue south of Forty-second street is already occupied by the subway under construction. Second and Third avenues are occupied by elevated railways, and while it is possible to build a subway along a street occupied by an elevated railway, it would not seem prudent to duplicate facilities until all other routes have been occupied. There is, therefore, a choice left between First and Lexington avenues. I have proposed Lexington avenue as the best street to be occupied for the reason that it lies nearer to the centre of traveling population. An examination of the traffic returns of the Second and Third avenue elevated railways shows that the passengers per station on the Third avenue line are more than twice as numerous as those on the Second avenue line, and that the bulk of the travel on the Third avenue line comes from points along or west of it. A line west of Third avenue, or under Lexington avenue, for instance, would thus supply the most urgently demanded transportation facilities, and would best serve to relieve the present congestion of the most crowded elevated line on the east side.

Another reason for the choice of Lexington avenue is that the day will come when there will be required a great through line on the east side of the City, providing an express service, not only greatly in advance of the express service offered by any existing line, but greater than that proposed on any projected line. Such a line will be needed to carry the people living in the trans-Harlem districts to the commercial area south of Forty-second street. First avenue is the most available for such a line, and should be reserved for that purpose. If an independent east side line is to be constructed, it would seem, therefore, that it would be best to extend the Lexington avenue line south. Lexington avenue terminates at the south end of Fourteenth street. If a line is to be carried southerly along Lexington avenue to Fourteenth street, it would have to be thence carried across private property to the Bowery below Eighth street, or diagonally under private property to Third avenue, and thence south along the

Bowery. A line along the Bowery is subject to the same criticism as lines along Second and Third avenues, namely, the duplication of existing facilities. The Second avenue elevated runs south over that avenue to Twenty-third street, whence it runs easterly to First avenue, and thence southerly along the latter. I would suggest, therefore, that the proposed Lexington avenue line be carried south from Forty-fifth street to, say, Twenty-fourth street, and through Twenty-fourth street to Second avenue, and thence southerly along that thoroughfare and Chrystie street. At Grand street this route crosses the route of the proposed connection with the Williamsburgh Bridge, with which it could be made to connect. Or it could be continued along Chrystie street and private property to Catherine street, to Water street, to South Ferry.

In view of the various lines that I have already proposed to the Board being undetermined, it is very difficult to make any precise recommendations, as the location of any additional line will be much affected by the action of the Board on the lines already suggested or amendments thereto.

Very truly yours,

Wm. Barclay Parsons, *Chief Engineer.*

The only extension made to the subway has been an extension from the intersection of Brook avenue and Westchester avenue to Westchester and Third avenues, to connect there with the Suburban division of the Manhattan Elevated Railroad.

The original route of the subway was along Westchester avenue, coming out of ground in the middle of that thoroughfare so as to pass from underground to elevated. In order that this transition might be made without interfering with traffic a slight change of route was made and a right of way was acquired through private property. During the year, however, the Interborough Company, the lessees of the subway, acquired a lease of the Manhattan Elevated Railway, and made a tender to connect the elevated portion of the Rapid Transit line with the Suburban division, and run through trains from The Bronx southerly along the Second and Third avenue divisions for a single fare. In order to accomplish this the above-mentioned link had to be constructed. This matter, after careful consideration by the municipal authorities, was finally passed, and an application was at once made for the necessary consent to the abutting property owners.

On June 24 the Interborough Rapid Transit Company made an application for an extension over the Manhattan Valley viaduct to Fort Lee ferry via Manhattan street. This application was approved by the Board and referred to the municipal authorities, where it is now pending. In like manner, on May 21, the Hudson and Manhattan Railroad Company made an application for a tunnel from Jersey City beneath the Hudson river, passing up Cortlandt street, thence through private property on the west side of Church street, where the station is to be located, thence westerly under Fulton street to the river, and so return to Jersey City. After careful consideration by the Board, it was finally decided to grant a franchise to this company, similar in terms to the franchise granted to the New York and Jersey Railroad Company for the tunnel from Jersey City reaching Manhattan Island at the foot of Morton street. From the station at Church street a foot subway is to be constructed under Dey street to connect with both platforms of the Rapid Transit station at Broadway. This franchise was passed by the Board on November 24, and was referred to the municipal authorities for constitutional consent. The matter is now pending. Maps of these three extensions are attached to this report.

The Court of Appeals of the State of New York during the year rendered a final decision upon the question as to whether ducts should be treated as an integral part of the subway construction and paid for as an extra on the contract, or whether they should be treated as a unit and paid for by the Contractor and subsequently paid for by the city at the conclusion of the lease. The decision was that the former was the proper view to take. Work on these ducts, which had been treated in the previous report as excess work, has therefore in due course been charged to extra work, and so appears in this report. The total value of ducts constructed to date is $1,395,000. These ducts are made of terra cotta, four holes in each piece, with a diameter of 3½ inches each, and laid in a tier directly behind the steel columns in the side wall. Ducts for 64 cables have been provided in each wall from the City Hall to Ninety-sixth street, and from this point northerly 64 cables have been provided for both the east side line and for the west side line. Regular water-proofing and protective brick work are outside of the ducts. These ducts are therefore an integral part of the subway construction. Manholes in the street are located at intervals of usually 400 to 500 feet. The electric cables carrying the electricity for operating purposes are introduced through these manholes and then drawn through the ducts. Should it be necessary to introduce new cables or remove old ones while the railway is being operated, the same can be done through these manholes without in any way interfering with the running of trains. In order to avoid the inconvenience of a vertical tier of ducts as stations, a larger manhole is constructed at each end of the station, and the cables are given a quarter turn and run into a bench of ducts laid horizontally beneath the platform floor.

Under the terms of the New York and Jersey Railroad franchise, granted July 10, 1902, as given in full in the previous report, for a tunnel railroad underneath the Hudson river between Morton street, Manhattan, and Fifteenth street, Jersey City, that Company during the year constructed under the waters of the North river, in the State of New York, 863 feet of 18-ft. diameter iron-tube tunnel. Of the New York approach, from the shaft located on West street, there was constructed 10 feet of the north tube tunnel of this approach, towards the foot of Morton street. The shaft was opened and repaired in the caisson which was first sunk, and a shield erected in the chamber so formed. It is intended to have two parallel tubes of 15¼ feet and 18 feet in internal diameter, which will accommodate the transportation of cars between Jersey City and New York. This tunnel was originally the old Hudson river tunnel; it was started in 1874, was continued intermittently until 1882, when nearly 2,000 feet of the north tube and about 550 feet of the south tube were constructed, and operations were then suspended. Later, a foreign company was organized to carry on this work, but which was abandoned after about 1,900 feet of the north tube had been completed. Finally, the present company was organized and work resumed on both tubes of the tunnel, which is now progressing rapidly.

The Pennsylvania, New York & Long Island Railroad Company also began operations under its franchise, granted October 9, 1902, referred to in the report of 1902, for a New York underground station, and a tunnel railroad under the North and East rivers, connecting New York with New Jersey and the borough of Queens. This company, in the first part of the year, commenced their work by demolishing the buildings on West Thirty-second street, near Eleventh avenue, at which place will be located the plant for the construction of the subaqueous tunnels under the North river and the tunnels under Thirty-second street and the construction of the working shaft at Thirty-second street and Eleventh avenue. On the site of the tunnel station in that section of the city, bounded by Seventh avenue, Thirty-first street, Ninth avenue and Thirty-third street, nearly one-half of the buildings were removed preparatory to the construction of the station; and on the site of the shaft east of First avenue, between Thirty-second and Thirty-third streets, the buildings were also removed. Considerable preliminary study is required in a work of this magnitude, but as soon as all the details are completed the work will be vigorously prosecuted and contracts awarded for its execution at the earliest date practicable.

During the past year, Mr. Beverly R. Value, who since the beginning of the work has been Engineer of the Third Division, resigned to accept a higher position elsewhere. The place thus left vacant was filled by the promotion of Mr. C. V. V. Powers, the former Senior Assistant Engineer of the division.

On April 1 the staff was organized for the Fifth Division, being the division covering the East river tunnels and the subway in Brooklyn, and Mr. Robert Ridgway, formerly Senior Assistant Engineer of the Second Division, was promoted to be Division Engineer in charge. The following Assistant Engineers were taken from other divisions and attached to the Fifth Division:

Frederick C. Noble,	William F. Stevenson,
Lazarus White,	John W. Goodridge,
Alexander Thomson, Jr.,	James F. Sanborn.

In order to take care of the work on Broadway in Manhattan, Mr. Albert Carr, Engineer of the First Division on Contract No. 1, was placed in charge, adding these duties to the duties previously assumed.

At the close of the year 1903, there were 321 appointments in force, divided as follows:

Engineers	81
Draughtsmen	21
Rodmen	69
Axemen	20
Inspectors	112
Chemist	1
Secretary	1
Clerks	15
Photographer	1

The following table indicates the additions and other changes in the staff of the Chief Engineer that have taken place during the year:

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
Beverly, R. Value	Division Engineer	June 1, 1900	Mar. 1, 1903	Resigned.
C. V. V. Powers	Division Engineer	Mar. 1, 1903	....	Promoted from Asst. Engr.
Robert Ridgway	Division Engineer	Mar. 23, “	....	Promoted from Asst. Engr.
Joshua Binion	Assistant Engineer	May 1, 1900	Sept. 1, 1903	Resigned.
Geo. A. Taber	Assistant Engineer	Aug. 1, “	Feb. 13, “	Transferred to Dept. of Water Supply.
Theodore W. C. Happel	Assistant Engineer	Aug. 1, “	Feb. 28, “	Died Feb. 28, 1903.
Julian Thornley	Assistant Engineer	Aug. 1, “	July 1, “	Resigned.
William Hauck	Assistant Engineer	Oct. 1, “	Dec. 1, “	Transferred to Aqueduct Commission.
Philip P. Farley	Assistant Engineer	Oct. 15, “	June 25,	Resigned.
Edmund P. Ramsey	Assistant Engineer	Apr. 4, 1901	July 1, “	Resigned.
Chas. U. Powell	Assistant Engineer	Apr. 8, “	July 1, “	Resigned.
James W. Carrier	Assistant Engineer	June 19, “	July 1, “	Resigned.
Frederick R. Harris	Assistant Engineer	Oct. 8, “	Jan. 26, “	Resigned.
Guy W. Culgin	Assistant Engineer	Dec. 1, “	Sept. 1, “	Resigned.
Arthur E. Wenige	Assistant Engineer	June 1, 1902	Mar. 6, “	Transferred to Dept. of Finance.
John D. Griffiths	Assistant Engineer	June 1, “	Mar. 9, “	Transferred to Dept. of Water Supply
Max Feldman	Assistant Engineer	Sept. 13, “	Mar. 12, “	Resigned.
J. Whitford Bennett	Assistant Engineer	Mar. 1, 1903	....	Promoted from Rodman.
Richard A. Berry	Assistant Engineer	Mar. 1, “	....	Promoted from Rodman.
Charles N. Green	Assistant Engineer	Mar. 1, “	....	Promoted from Inspector of Steel.
Traugott F. Keller	Assistant Engineer	Mar. 1, “	Mar. 9, 1903	Resigned.

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
Percy E. Lyon	Assistant Engineer	Mar. 1, 1903		Promoted from Inspector of Masonry.
Albert J. Mayell	Assistant Engineer	Mar. 1, "		Promoted from Rodman.
Frank J. Perry	Assistant Engineer	Mar. 1, 1903		Promoted from Rodman.
Jas. F. Sanborn	Assistant Engineer	Mar. 1, "		Promoted from Rodman.
Andrew Veitch, Jr.	Assistant Engineer	Mar. 1, "		Promoted from Rodman.
Israel V. Werbin	Assistant Engineer	Mar. 1, "		Promoted from Rodman.
Milton Kempner	Assistant Engineer	Mar. 9, "		
Bertrand H. Wait	Assistant Engineer	Mar. 9, "		
Thad. L. Wilson	Assistant Engineer	Mar. 11, "		
John R. McGrath	Assistant Engineer	Apr. 1, "		Promoted from Rodman.
Aaron I. Raisman	Assistant Engineer	Apr. 1, "		Promoted from Bridge Draughtsman.
Samuel F. Thomson	Assistant Engineer	July 23, "		
Constant W. Booth, Jr.	Assistant Engineer	Aug. 1, "		Promoted from Rodman.
Arthur E. Clark	Assistant Engineer	Oct. 20, "		
Albert H. Chandler	Assistant Engineer	Oct. 20, "		
Ralph W. Greenlaw	Assistant Engineer	Oct. 20, "		
Franklin S. Storey	Assistant Engineer	Oct. 20, "		
Chauncey DeVoe	Assistant Engineer	Nov. 1, "		Promoted from Rodman.
Samuel D. Bleich	Assistant Engineer	Nov. 11, "		
Josiah A. Briggs, Jr.	Assistant Engineer	Dec. 17, "		
Alfred M. Wyman	Assistant Engineer	Dec. 17, "		
William J. Duncan	Assistant Engineer	Dec. 21, "		Promoted from Inspt. of Steel.
Chas. S. McCarthy	Draughtsman	Oct. 11, 1901	May 1, 1903	Resigned.
Jacob Schmitt	Draughtsman	Aug. 1, 1902	May 25, "	Resigned.
Jas. G. McKinley	Draughtsman	Dec. 12, "	June 4, "	Resigned.

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
Chas. A. Thomas	Draughtsman	Jan. 1, 1903		Promoted from Rodman.
Walter L. Tremper	Draughtsman	Apr. 16, “	May 1, 1903	Promoted from Transitman—Resigned.
Calvin I. Crocker	Draughtsman	May 25, “	Nov. 1, “	Transf'd to Dept. of Bridges.
Julian P. W. Richmond	Draughtsman	June 12,	Sept. 1, “	Resigned.
Edward Pfortner	Draughtsman	Sept. 1, “		Promoted from Rodman.
Cornelius Mulcahy	Draughtsman	Dec. 1, “		Promoted from Rodman.
Richard W. McDonald	Rodman	June 9, 1900	Mar. 16, 1903	Transferred to Dept. of Docks.
Edward Herrmann	Rodman	June 14, “	Feb. 19, “	Resigned.
Stephen H. Dolan	Rodman	June 23, “	Mar. 16, “	Resigned.
Peter F. Daly	Rodman	Aug. 1, “	May 25, “	Resigned.
Geo. A. Hefter	Rodman	Aug. 1, “	Nov. 16, “	Transferred to Bor. of Bronx.
William P. Gay	Rodman	Sept. 8, “	June 8, “	Transferred to Dept. of Water Supply, Brooklyn.
Walter P. Butler	Rodman	Sept. 17, “	Apr. 1, “	Resigned.
Henry J. Lynch	Rodman	Aug. 1, 1901	Apr. 1, “	Resigned.
Edward T. Ebert	Rodman	Aug. 1, “	Nov. 15,	Transferred to Bor. of Bronx.
William G. Foy	Rodman	Aug. 5, “	Jan. 5, “	Resigned.
Isaac S. Voorhees	Rodman	Aug. 19, “	Jan. 1, “	Resigned.
Francis A. Dillon	Rodman	Sept. 1,	Aug. 1, “	Resigned.
George H. Knight, Jr.	Rodman	Sept. 18, “	Mar. 16, “	Resigned.
Leonard H. Van Every	Rodman	Oct. 15, “	Apr. 1, “	Resigned.
Thomas B. Dyer	Rodman	Oct. 17, “	Apr. 1, “	Resigned.
Tryon P. Edwards	Rodman	Oct. 18, “	Mar. 15, “	Resigned.
Geo. J. Schwietzer	Rodman	Dec. 16, “	May 28, “	Resigned.
Leo C. Clarke	Rodman	Jan. 1, 1902	Mar. 17, “	Transferred to Bor. of Bronx.

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
William J. Keogh	Rodman	Feb. 15, 1902	July 9, 1903	Resigned.
Ottó E. Bernhardt	Rodman	Feb. 15, “	Oct. 1, “	Transferred to Bor. of Bronx.
William B. Caterson	Rodman	Apr. 3, “	Nov. 15, “	Resigned.
John S. Reeve	Rodman	June 3, “	July 1, “	Resigned.
Godfrey Branfuehr	Rodman	July 15, “	Oct. 1, “	Resigned.
Tobias Hochlerner	Rodman	Nov. 5. “	Mar. 4,	Transferred to Dept. of Water Supply.
Wm. E. Haefner	Rodman	Jan. 1, 1903		Promoted from Axeman.
Augustus T. Weisse	Rodman	Jan. 1, “	Oct. 1, “	Promoted from Axeman—Transferred to Dept. of Water Supply.
DeLos N. Hicok	Rodman	Feb. 24, “		
Hugh F. Bresnan	Rodman	Mar. 1, “		Promoted from Axeman.
Albert E. Comstock	Rodman	Mar. 1, “		Promoted from Axeman.
John T. Dowd	Rodman	Mar. 1, “	July 9, 1903	Promoted from Axeman—Transferred to Dept. of Water Supply, Brooklyn.
William T. Doyle	Rodman	Mar. 1, “	Sept. 1, 1903	Promoted from Axeman—Resigned.
Peter A. Farrell	Rodman	Mar. 1 “		Promoted from Axeman.
William F. Mercer	Rodman	Mar. 1 “		Promoted from Axeman.
Herman Schweitzer	Rodman	Mar. 19 “		
Emil H. Staudinger	Rodman	Mar. 27, “	July 13, 1903	Transferred to Dept. of Parks, Brooklyn.
Harry C. Sweeney	Rodman	Mar. 27, “		
Louis W. Seiferd	Rodman	Mar. 30, “		
Robert W. Wood	Rodman	Mar. 30, “		

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
John C. Weiler	Rodman	Apr. 1, 1903		
William L. Selmer	Rodman	Apr. 1, "		
John E. F. Higgins	Rodman	Apr. 6, "		
Everett Agor	Rodman	Apr. 16, "		Promoted from Axeman.
Clifford G. Baxter	Rodman	Apr. 16, "		Promoted from Axeman.
Benj. F. Bemak	Rodman	Apr. 16, "		Promoted from Axeman.
Thomas Chambers	Rodman	Apr. 16, "		Promoted from Axeman.
Richard J. Cullen	Rodman	Apr. 16, "		Promoted from Axeman.
Rudolph F. Knochenhauer	Rodman	Apr. 16, "		Promoted from Axeman.
Frank McGuire	Rodman	Apr. 16, "		Promoted from Axeman.
Thos. E. Raymond	Rodman	Apr. 16, "		Promoted from Axeman.
Joseph A. Vertefeuille	Rodman	Apr. 16, "	Apr. 27, 1903	Promoted from Axeman—Resigned.
George M. Clark	Rodman	Apr. 17, "		
Joseph A. Connelly	Rodman	Apr. 20, "		
John F. Dunn, Jr.	Rodman	Apr. 20, "		Promoted from Axeman.
Edward B. Johnson	Rodman	Apr. 20, "		
Chas. M. Torpey	Rodman	Apr. 20, "		
Albert Goertz	Rodman	Apr. 23, "		
Ernest F. Schurman	Rodman	Apr. 23, "		
Julius A. Lewis	Rodman	May 6, "		Promoted from Axeman.
John McMurray	Rodman	May 7, "	Oct. 19, 1903	Resigned.
Robt. A. Kearns	Rodman	May 11, "		Promoted from Axeman.
Walter A. O'Brien	Rodman	May 11, "		Promoted from Axeman.
Stafford H. Ritchie	Rodman	May 17, "		Promoted from Axeman.
George S. Dillon	Rodman	May 18, "		Promoted from Axeman.
William A. Roffe	Rodman	May 18, "		Promoted from Axeman.

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
Abram W. Birmingham	Rodman	June 3, 1903		
Frederick F. Decker	Rodman	June 5, "		
Harry Hollander	Rodman	June 15, "		
Julius C. Landon	Rodman	June 15, "		
Gerardo Immediato	Rodman	Oct. 20, "		
Geo. Murgatroyd	Rodman	Oct. 20, "		
Sherman M. Turrill	Rodman	Oct. 20, "		
Everett W. Horton	Rodman	Nov. 1, "		Promoted from Axeman.
Arthur J. Livingston	Rodman	Nov. 1, "		Promoted from Axeman.
John P. Lonergan	Rodman	Nov. 1, "		Promoted from Axeman.
James Pearce, Jr.	Rodman	Nov. 1, "		
Edward H. Hopson	Rodman	Nov. 19, "		
Herbert Spencer	Rodman	Nov. 19, "		
Louis C. Thompson	Rodman	Dec. 1, "		Promoted from Axeman.
Ernest G. Manning	Rodman	Dec. 3, "		
Harry L. Coyne	Rodman	Dec. 5, "		Promoted from Axeman.
Edward H. Wernberg	Rodman	Dec. 21, "		Promoted from Axeman.
James Brogan	Axeman	Mar. 4, 1902	Nov. 16, 1903	Died.
Frank Berbert	Axeman	Sept. 16, "	Nov. 16 "	Transferred to Bor. of Bronx.
J. Spencer Crosby	Axeman	Dec. 1, "	May 1, "	Resigned.
Joseph Cunningham	Axeman	Mar. 16, 1903	Sept. 17, "	Resigned
Joseph O'Donnell	Axeman	Mar. 24, "		
John Wilson	Axeman	Mar. 24, "		
Frank C. Sweeney	Axeman	Mar. 30, "		
Chas. A. Ziesing	Axeman	Mar. 30, "		
William H. Fletcher	Axeman	Apr. 6, "		
Jeremiah J. Keely	Axeman	Apr. 6, "		

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
Robert A. H. Wettje	Axeman	Apr. 6, 1903		
Frederick P. Volckmann	Axeman	Apr. 7, “		
James P. Hynes	Axeman	June 11, “		
John McKeon	Axeman	July 16, “		Transferred from Aqueduct Commission.
William R. Porter	Axeman	July 18, “		
Warren C. Metz	Axeman	Aug. 29, “		
Michael J. O'Neill	Axeman	Aug. 29, “	Oct. 3, 1903	Resigned.
Ernest Scholldorfer	Axeman	Oct. 1, “		
John E. Simmons	Axeman	Oct. 1, “		
John O'Rourke	Axeman	Oct. 3, “		
Eduardo Breker	Axeman	Oct. 5, “		
Harry M. Adams	Axeman	Oct. 13, “		
Charles J. Tilden	Inspector of Steel	Feb. 21, 1901	Sept. 25, 1903	Resigned.
George R. Miller	Inspector of Steel	Apr. 13, “	May 1, “	Resigned.
John E. Newlands	Inspector of Steel	Jan. 5, 1903		
Frederick T. Neumann	Inspector of Steel	May 14, “		
William Phelan	Inspector of Masonry	Apr. 4, 1900	Oct. 1, 1903	Resigned.
William J. Reilly	Inspector of Masonry	June 26, “	Jan. 1, “	Discharged—lack of Work.
Frederick P. Gaudineer	Inspector of Masonry	Aug. 24, “	May 20, “	Resigned.
Martin V. Dolan	Inspector of Masonry	Sept. 16, “	July 13, “	Resigned.
Seymour P. Bradley	Inspector of Masonry	Oct. 15, “	Dec. 12, “	Resigned.
Forbes Gerard	Inspector of Masonry	Jan. 24, 1901	June 13, “	Discharged—lack of work.
Matthew J. Conley	Inspector of Masonry	Feb. 11, “	Nov. 27, “	Discharged.
Michael M. Reynolds	Inspector of Masonry	Apr. 12, “	Sept. 10, “	Resigned.
Walter F. Smith	Inspector of Masonry	June 19, “	June 13, “	Discharged—lack of work.
Carl Schmidtke	Inspector of Masonry	Aug. 7, “	Aug. 17, “	Resigned.

NAME	TITLE	APPOINTMENT TO PRESENT RANK	CESSATION OF SERVICE	REMARKS
Thos. H. McElroy	Inspector of Masonry	Sept. 15, 1901	Jan. 3, 1903	Died.
William J. Fox	Inspector of Masonry	Apr. 15, 1902	June 23, “	Resigned.
James A. Gearty	Inspector of Masonry	June 10, “	May 9, “	Discharged—lack of work.
Oscar Wm. Horne	Inspector of Masonry	Aug. 30, “	Nov. 11, “	Resigned.
Charles A. Brown	Inspector of Masonry	Oct. 1, “	Aug. 24, “	Resigned.
Thomas Dorsey	Inspector of Masonry	Feb. 19, 1903		
Timothy Relihan	Inspector of Masonry	Mar. 31, “		
Joseph H. Tonyan	Inspector of Masonry	Mar. 31, “	Nov. 30, 1903	Resigned.
Drew Linard	Inspector of Masonry	May 7, “		Reinstated.
Patrick F. Burns	Inspector of Masonry	July 20, “		
Henry F. Schluenzen	Stenographer	Aug. 6, 1900	Mar. 1, 1903	Resigned.
Robert C. Moore	Stenographer	June 26, 1902	Oct. 6, “	Resigned.
Benj. S. Blatteis	Stenographer	Apr. 23, 1903		
Robert L. Albert	Stenographer	May 13, “		
William E. Dalton	Clerk	Nov. 1, “		Promoted from Junior Clerk.
John E. Copeland	Junior Clerk	Mar. 16, “		Promoted from Office Boy.
William Goldstein	Junior Clerk	Mar. 16, “		Promoted from Office Boy.
John L. Lilley	Junior Clerk	Mar. 16, “		Promoted from Office Boy.
Louis J. Madden	Office Boy	Mar. 19, “		
Samuel Singer	Office Boy	Aug. 13, “		
James J. Boyle	Office Boy	Aug. 29, “		

The executive staff as constituted during the year comprised the following officers:

George S. Rice	Deputy Chief Engineer
Albert Carr	Engineer First Division
Alfred Craven	Engineer Second Division
C. V. V. Powers	Engineer Third Division
Eugene Klapp	Engineer Fourth Division
Robert Ridgway	Engineer Fifth Division
Calvin W. Hendrick	Engineer Sewer Division
St. John Clarke	General Inspector of Designs
W. A. Aiken	General Inspector of Material
D. L. Turner	Asst.-Engr. in Charge of Stations
M. J. Farrell	Secretary to Chief Engineer

During the year there were 135 casualties, of which 23 were fatal, and of the total number 123 were employes.

It will be seen by the Auditor's report that work to the extent of $35,664,349.12 has been vouchered to date, and that during the same period the total disbursements on account of engineering, including salaries, office rent and all supplies, amounted to $488,359.59, or a little more than 4 per cent. of the total cost of the work.

The Chief Engineer again expresses his appreciation of the continued efficient and faithful services rendered by his staff; and acknowledges also the energetic efforts of the Contractor, Sub-Contractors and their Engineers towards completing a work so auspiciously begun.

Respectfully submitted,

WM. BARCLAY PARSONS,
Chief Engineer.

REPORT

OF THE

AUDITOR

THE CITY OF NEW YORK.

ROARD OF RAPID TRANSIT RAILROAD COMMISSIONERS.

Auditor's Office, January 1, 1904.

The Honorable Board of Rapid Transit Railroad Commissioners:

GENTLEMEN—I have the honor to submit herewith a report of the Auditor, in relation to the finances of the Boad of Rapid Transit Railroad Commissioners, for the period January 1, 1903, to December 31, 1903, giving in general and in detail, viz: —

REQUISITIONS FOR THE GENERAL FUND: (Folio 245) A statement showing the requisitions made upon the Board of Estimate and Apportionment for the authorization for the issue of Revenue Bonds for the requirements of the Board of Rapid Transit Railroad Commissioners, from January 1, 1903, to December 31, 1903.

APPROPRIATION: FOR THE GENERAL FUNDS (Folio 246.) A statement showing the Appropriations made by the Board of Estimate and Apportionment for the purposes of the Board of Rapid Rapid Transit Railroad Commissioners, from January 1, 1903, to December 31, 1903.

DISBURSEMENTS OF THE GENERAL FUND: Statements showing the Disbursements of the General Fund made under the direction of the Rapid Transit Board, from January 1, 1903, to December 31, 1903, viz.:

Administrative and General Office. (Folio 247.)

Engineering. (Folio 248.)

Legal—A summary of General Fund Disbursements. (Folio 249.)

REQUISITIONS AND APPROPRIATIONS FOR EXTRA WORK. MANHATTAN-BRONX CONSTRUCTION: (Folio 250.) A statement showing the Requisitions made upon the Board of Estimate and Apportionment for the authorization for the issue of Corporate Stock of the City of New York, and the appropriations made by the said Board of Estimate and Apportionment, the proceeds thereof to be applied to the requirements for Extra Work done, and materials furnished, under provision of the contract with *John B. McDonald, Contractor,* dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from February 21, 1900, to December 31, 1903.

Corporate Stock of The City of New York. Manhattan-Bronx Construction: (Folios 251 to 260.) A statement statement showing the issues of Corporate Stock of The City of New York, from January 1, 1903, to January 28, 1904, the proceeds thereof to be applied to the construction of the Manhattan-Bronx Rapid Transit Railroad.

Disbursements for Work Done and Materials Furnished. Manhattan-Bronx Construction: (Folio 261.) A statement showing the requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made to *John B. McDonald, Contractor,* for work done and materials furnished under contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903.

Disbursements for Extra Work Done (Including Ducts) and Materials Furnished. Manhattan-Bronx Construction: (Folio 262.) A statement showing the requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made to *John B. McDonald, Contractor,* for Extra Work done and materials furnished under contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903, pursuant to resolutions adopted by the said Rapid Transit Board, and in accordance with agreements between the Contractor and the City, and the sureties to the said contract of February 21, 1900.

DISBURSEMENTS FOT TERMINALS. MANHATTAN-BRONX CONSTRUCTION: (Folio 263.) A statement showing the requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made for Terminals, under provision of the contract with *John B. McDonald, Contractor*, dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from February 21, 1900, to December 31, 1903,

DISBURSEMENTS FOR REAL ESTATE. MANHATTAN-BRONX CONSTRUCTION: (Folios 264 to 266, inclusive.) A statement showing the payments authorized under the direction of the Board of Rapid Transit Railroad Commissioners, to be made for Real Estate acquired for and in behalf of the City of New York, under provision of the contract with *John B. McDonald, Contractor,* dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903.

PAYMENT OF INTEREST ON THE CORPORATE STOCK. MANHATTAN-BRONX CONSTRUCTION: Folio 267.) A statement showing the payments made under the direction of the City Comptroller for Interest due on the Corporate Stock issued by The City of New York for the construction of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903,—A summary of the Manhattan-Bronx Construction Fund Disbursements.

CORPORATE STOCK OF THE CITY OF NEW YORK. BROOKLYN-MANHATTAN CONSTRUCTION: (Folio 268.) A statement showing the issues of Corporate Stock of The City of New York, from July 21, 1902, to January 25, 1904, the proceeds thereof to be applied to the construction of the Brooklyn-Manhattan Rapid Transit Railroad.

DISBURSEMENTS FOR WORK DONE AND MATERIALS FURNISHED. BROOKLYN-MANHATTAN CONSTRUCTION: (FOLIO 269.) A statement showing the requisitions made upon the Board of

Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made to *Rapid Transit Subway Construction Company, Contractor,* for work done and materials furnished under contract dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903.

DISBURSEMENTS FOR REAL ESTATE. BROOKLYN-MANHATTAN CONSTRUCTION: (Folio 270.) A statement showing the payments authorized under the direction of the Board of Rapid Transit Railroad Commissioners, to be made for Real Estate acquired for and in behalf of The City of New York, under provision of the contract with *Rapid Transit Subway Company, Contractor,* dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903.

PAYMENT OF INTEREST ON THE CORPORATE STOCK. BROOKLYN-MANHATTAN CONSTRUCTION: (Folio 271.) A statement showing the payments made under the direction of the City Comptroller for Interest due on the Corporate Stock issued by The City of New York, for the construction of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903.—A summary of Brooklyn-Manhattan Construction Fund Disbursements.

BALANCES: (Folios 272 and 273.) Statements showing the Yearly Balances of the General Fund, and of the Manhattan-Bronx and the Brooklyn-Manhattan Construction Funds.

SECURITIES: (Folios 274 to 278, inclusive.) A transcript of information relative to Securities.

A RECAPITULATION: (Folios 279 to 283, inclusive.)

Respectfully submitted,

H. A. D. HOLLMANN.
Auditor.

GENERAL FUND

REQUISITIONS

Statement of Requisitions made upon the Board of Estimate and Apportionment for the authorization for the issue of Revenue Bonds for the requirements of the Board of Rapid Transit Railroad Commissioners from January 1, 1903, to December 31, 1903.

December 11, 1902.	As stated on page 1881 of the minutes of the Rapid Transit Commission	$542,000 00
*April 16, 1903.	" " " " 2091 " " " " " " " "	(Re-appropriation. No Bonds to be issued.)
Total amount of Requisitions made upon the Board of Estimate and Apportionment for the requirements of the Board of Rapid Transit Railroad Commissioners, from January 1, 1903, to December 31, 1903		$542,000 00

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*Requisition made upon the Board of Estimate and Apportionment for the sum of $30,000 00 with which to provide for the payment of the compensation allowed by the Appellate Division of the Supreme Court for the services of the members of the Board of Rapid Transit Railroad Commissioners for the calendar year 1902, the Comptroller being authorized to pay said compensation out of the proceeds of special revenue bonds already authorized.

GENERAL FUND

APPROPRIATIONS

Statement showing the Appropriations made by the Board of Estimate and Apportionment for the purposes of the Board of Rapid Transit Railroad Commissioners, from January 1, 1903, to December 31, 1903.

Date	Issue of Revenue Bonds	Proceeds Deposited in the City Treasury		Total
January 9, 1903. As stated on page 6 of the minutes of the Board of Estimate and Apportionment..........	3% Bonds redeemable 1904..........	March 24, 1903..........	$100,000 00	
	" " " "..........	April 28, "..........	25,000 00	
	" " " "..........	May 15, "..........	50,000 00	
	" " " "..........	June 26, "..........	50,000 00	
	4% " " "..........	July 23, "..........	100,000 00	
	" " " "..........	" 29, "..........	45,000 00	
	" " " "..........	" 31, "..........	50,000 00	
	4½% " " "..........	November 5, "..........	10,000 00	
	4% " " "..........	" 10, "..........	25,000 00	
	5% " " "..........	" 11, "..........	25,000 00	
	4½% " " "..........	December 24, "..........	10,000 00	
	4% " " 1905..........	January 6, 1904..........	52,000 00	$542,000 00
Aprill 17, 1903. As stated on page 869 of said minutes..........	No Bonds to be issued..........	Re-appropriation..........		

Total amount of Appropriations made by the Board of Estimate and Apportionment for the purposes of the Board of Rapid Transit Railroad Commissioners from January 1, 1903, to December 31, 1903..........	$542,000 00

GENERAL FUND

DISBURSEMENTS

Statement showing the amount of Disbursements made under the direction of the Board of Rapid Transit Railroad Commissioners, from January 1, 1903, to December 31, 1903.

ADMINISTRATIVE AND GENERAL OFFICE

Compensation of Commissioners	$30,000.00
Salaries	7,219.92
Office Rental	2,000.01
Stationery, Printing and Supplies	4,015.65
Furniture	36.00
Stenography and Typewriting	7.55
Postage	20.26
Restoration of General Post Office Vault Flooring	279.23
Removal of Public Records, City Register's Office	2,064.16
Sundry Contingent Expenses	76.64
Total Amount of Administrative and General Office Disbursements	$45,719.42

DISBURSEMENTS—*Continued*

ENGINEERING

Salaries	$464,466.56
Office and Telephone Rentals	13,462.90
Stationery, Printing and Supplies	4,354.25
Furniture	2,515.63
Telegraph Service	207.32
Locomobile Service	363.22
Lighting	315.35
Janitor Service	189.87
Engineering Instruments and Supplies	7,607.52
Maps, Plans, Prints and Photographic Supplies	3,464.33
Disbursements (Traveling Expenses)	3,775.28
Stenography and Typewriting	14.85
Postage	703.32
Consulting Engineer's Services	250.00
Inspections, Tests and Analysis	1,933,55
Borings and Soundings	177.83
Architectural Services and Disbursements	11,231.19
Consulting Electrical Engineer's Services	3,750.00
Sundry Contingent Expenses	1,881.30
Total Amount of Engineering Disbursements	$520,664.27

DISBURSEMENTS—*Continued*

LEGAL

ADVERTISING.

In the matter of the application of the Board of Rapid Transit Railroad Commissioners for the appointment of Commissioners by the Appellate Division of the Supreme Court, First Judicial Department, to determine and report whether a railroad ought to be constructed and operated.—Modification of Park Avenue Section			$2,152,10

REAL ESTATE SEARCH AND APPRAISAL.

Fees for services of search and the appraisal of various properties			417,00

COUNSEL.

Fees		$20,000.00	
Disbursements, viz.			
Stenography and Typewriting	$800.05		
Printing	713.56		
For Searches	38.00		
Sundry Contingent Expenses	211.84		
		1,763.45	
			21,763.45
Total amount of Legal Disbursements			$24,332.55

GENERAL FUND

SUMMARY OF DISBURSEMENTS

January 1, 1903, to December 31, 1903.

Administrative and General Office	$45,719.42
Engineering	520,664.27
Legal	24,332.55
Total amount of General Fund Disbursements	$ 590,716.24

MANHATTAN-BRONX CONSTRUCTION FUND—Extra Work

REQUISITIONS AND APPROPRIATIONS

Statement of Requisitions made upon the Board of Estimate and Apportionment, for the authorization for the issue of Corporate Stock of The City of New York, and the Appropriations made by the said Board of Estimate and Apportionment, the proceeds thereof to be applied to the requirements for extra work done and materials furnished under provision of the contract with *John B. McDonald, Contractor*, dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from February 21, 1900, to December 31, 1903.

No.	Authorized.	Amount.	Appropriation.	Amount.	Total.
1.	January 15, 1903, As stated on page 1947 of the minutes of the Rapid Transit Board..........	$1,500,000 00	January 16, 1903, As stated on page 202 of the minutes of the Board of Estimate and Apportionment	$750,000 00	
			May 29, 1903, As stated on page 1219 of said minutes	500,000 00	
			July 29, 1903, As stated on page 1828 of said minutes	250,000 00	$1,500,000 00
2.	August 13, 1903, As stated on page 2254 of said minutes	1,500,000 00	August 18, 1903, As stated on page 1905 of said minutes	....	1,500,000 00

Total amount of requisitions made upon the Board of Estimate and Apportionment for the requirements for extra work, from February 21, 1900, to December 31, 1903..$3,000.000 00

Total amount of Appropriations made by the Board of Estimate and Apportionment, the proceeds to be applied to the requirements for extra work, from February 21, 1900, to December 31, 1903..$3,000,000 00

MANHATTAN-BRONX CONSTRUCTION FUND

CORPORATE STOCK

Statement showing the issue of Corporate Stock of The City of New York, from January 1, 1903, to January 28, 1904, the proceeds thereof to be applied to the construction of the Manhattan-Bronx Rapid Transit Railroad:

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
	1903				1903						
11	Jan. 22	$2,000,000 00	3½%	Nov. 1 1952	Jan. 23	3.387%	$1,000,000 00	....	$33,870 00		
						7.208%	250,000 00	....	18,020 00		
						6.954%	250,000 00	....	17,385 00		
								$1,500,000 00		$69,275 00	$1,569,275 00
					Jan. 26	6.692%	$250,000 00	....	$16,730 00		
						6.433%	250,000 00	....	16,082 50		
								500,000 00		32,812 50	532,812 50
12	Apr. 9	$500,000 00	3½%	Nov. 1 1952	Apr. 14	10%	$10 00	....	$1 00		
						3.50%	50,000 00	....	1,750 00		
						3.375%	35,000 00	....	1,181 25		
						3.25%	25,000 00	....	812 50		
						3.125%	17,000 00	....	531 25		
						3%	20,000 00	....	600 00		
								147,010 00		4,876 00	151,886 00
Amounts carried forward		....	....	....	....	....	....	$2,147,010 00	....	$106,963 50	$2,253,973 50

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward.......	1903		....	....	....	....	....	$2,147,010 00	....	$106,963 50	$2,253,973 50
					1903 Apr. 15	5%	$200 00	....	$10 00		
						4%	5,000 00	....	200 00		
						4%	1,000 00	....	40 00		
						3.70%	2,000 00	....	74 00		
						3.60%	1,000 00	....	36 00		
						3.50%	1,000 00	....	35 00		
						3.40%	1,000 00	....	34 00		
						2.609%	138,700 00	....	3,618 68		
								149,900 00		4,047 68	153,947 68
					Apr. 16	5%	$10,000 00	....	$500 00		
						4.50%	4,000 00	....	180 00		
						3.50%	2,240 00	....	78 40		
						3.50%	10,000 00	....	350 00		
						2.609	44,000 00	....	1,147 96		
								70,240 00		2,256 36	72,496 36
					Apr. 17	7.44%	$500 00	....	$37 20		
						2.609%	110,550 00	....	2,884 25		
								111,050 00		2,921 45	113,971 45
					Apr. 18	5%	$300 00	....	$15 00		
						3.52%	10,000 00	....	352 00		
Amounts carried forward.......			....	....	....	....	$10,300 00	$2,478,200 00	$367 00	$116,188 99	$2,594,388 99

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward......			....	....	....	....	$10,300 00	$2,478,200 00	$367 00	$116,188 99	$2,594,388 99
	1903				1903	3.51%	10,000 00	....	351 00		
						3.625%	1,500 00	....	54 38		
								21,800 00		772 38	22,572 38
13	May 12	$1,000,000 00	3½%	Nov. 1 1952	May 13	4.299%	$39,000 00	....	$1,676 61		
								39,000 00		1,676 61	40,676 61
					May 14	4.299%	$180,000 00	....	$7,738 20		
								180,000 00		7,738 20	187,738 20
					May 15	6.50%	$5,000 00	....	$325 00		
						6.15%	2,000 00	....	123 00		
								7,000 00		448 00	7,448 00
					May 16	4.89%	$100,000 00	....	$4,890 00		
								100,000 00		4,890 00	104,890 00
					May 18	4.299%	$670,000 00	....	$28,803 30		
						7.44%	500 00	....	87 20		
								670,500 00		28,840 50	699,340 50
					May 19	5%	$500 00	....	$25 00		
								500 00		25 00	525 00
					May 22	8.75%	$1,000 00	....	$87 50		
						7.44%	1,000 00	....	74 40		
						6.14%	1,000 00	....	61 40		
								3,000 00		223 30	3,223 30
Amounts carried forward........			....	....	....	....	....	$3,500,000 00	....	$160,802 98	$3,660,802 98

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward........			....	....	....	....	....	$3,500,000 00	....	$160,802 98	$3,660,802 98
14	1903 July 22	$2,500,000 00	3½%	Nov. 1 1952	1903 July 24	1.44%	$44,000 00	....	$633 60		
						1.24%	20,000 00	....	248 00		
						1.125%	50,000 00	....	562 50		
						1.04%	10,000 00	....	104 00		
						1%	10,000 00	....	100 00		
						.875%	50,000 00	....	437 50		
						.84%	10,000 00	....	84 00		
						.64%	10,000 00	....	64 00		
						.625%	55,000 00	....	343 75		
								259,000 00		2,577 35	261,577 35
					July 25	2.62%	$30,000 00	....	$786 00		
						2.25%	1,500 00	....	33 75		
								31,500 00		819 75	32,319 75
					July 27	4.50%	$300 00	....	13 50		
						4.40%	500 00	....	22 00		
						4.25%	5,000 00	....	212 50		
						4%	5,000 00	....	200 00		
						3.75%	5,000 00	....	187 50		
						3.50%	1,500 00	....	52 50		
						3%	2,000 00	....	60 00		
Amounts carried forward........			....	....	....	....	$19,300 00	$3,790,500 00	$748 00	$164,200 08	$3,954,700 08

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward.......	1903		....	....	....	....	$19,300 00	$3,790,500 00	$748 00	$164,200 08	$3,954,700 08
					1903	2.50%	200 00	....	5 00		
						2.39%	1,500,000 00	....	35,850 00		
						2.03%	100,000 00	....	2,030 00		
						2%	1,000 00	....	20 00		
						1.26%	11,000 00	....	138 60		
						1.25%	25,000 00	....	312 50		
						.75%	25,000 00	....	187 50		
								1,681,500 00		39,291 60	1,720,791 60
					July 28	2.50%	$50,000 00	....	$1,250 00		
						2.41%	100,000 00	....	2,410 00		
						.815%	100,000 00	....	815 00		
								250,000 00		4,475 00	254,475 00
					July 29	.625%	$276,400 00	....	$1,727 50		
						2%	100 00	....	2 00		
								276,500 00		1,729 50	278,229 50
					Aug. 1	3.50%	$1,500 00	....	$52 50		
								1,500 00		52 50	1,552 50
*15	Oct. 8	$155,000 00	3½%	Nov. 1 1952	Oct. 8	....	$155,000 00	....	....		
								155,000 00	....	....	155,000 00
Amounts carried forward.......			....	....	....	....	....	$6,155,000 00	....	$209,748 68	$6,364,748 68

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK. Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	Amount of Proceeds Credited
Amounts brought forward.......								$6,155,000 00		$209,748 68	$6,364,748 68
*16	1903 Oct. 23	$510,000 00	3½%	Nov. 1 1952	1903 Oct. 23		$510,000 00				
								510,000 00			510,000 00
*17	Oct. 28	$500,000 00	3½%	Nov. 1 1952	Oct. 28		$500,000 00				
								500,000 00			500,000 00
18	Nov. 19	$2,000,000 00	3½%	Nov. 1 1953	Nov. 21	1.25%	$10,000 00		$125 00		
								10,000 00		125 00	10,125 00
					Nov. 23	3.50%	$300 00		$10 50		
						2.29%	75,000 00		1,717 50		
						2%	1,300 00		26 00		
						1.85%	10,000 00		185 00		
						1.79%	75,000 00		1,342 50		
						1.29%	75,000 00		967 50		
						1.25%	140 00		1 75		
						1.20%	10 00		12		
						1.10%	10 00		11		
						1.02%	5,000 00		51 00		
						1%	10 00		10		
						.90%	10 00		09		
						.80%	10 00		08		
						.79%	75,000 00		592 50		
Amounts carried forward.......							$316,790 00	$7,175,000 00	$4,894 75	$209,873 68	$7,384,873 68

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward.......			....	....	....	....	$316,790 00	$7,175,000 00	$4,894 75	$209,873 68	$7,384,873 68
	1903				1903	.70%	10 00	....	07		
								316,800 00		4,894 82	321,694 82
					Nov. 24	1.50%	$5,000 00	....	$75 00		
						.75%	25,000 00	....	187 50		
						1.03%	9,500 00	....	97 85		
						1.65%	5,000 00	....	82 50		
						1%	5,000 00	....	50 00		
						1.02%	5,000 00	....	51 00		
						.70%	15,000 00	....	105 00		
								69,500 00		648 85	70,148 85
					Nov. 25	6.77%	$100,000 00	....	$677 00		
						7.05%	25,000 00	....	176 25		
						1.20%	20,000 00	....	240 00		
						1.75%	4,000 00	....	70 00		
						1.53%	100,000 00	....	1,530 00		
						2%	1,000 00	....	20 00		
						2.41%	25,000 00	....	602 50		
						2.31%	25,000 00	....	577 50		
						2.21%	25,000 00	....	552 50		
						2.11%	25,000 00	....	527 50		
Amounts carried forward.......			....	....	....	....	$350,000 00	$7,561,300 00	$4,973 25	$215,417 35	$7,776,717 35

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward.......	1903		....	....	 1903	....	$350,000 00	$7,661,300 00	$4,973 25	$215,417 35	$7,776,717 35
						2.01%	25,000 00	....	502 50		
						1%	5,000 00	....	50 00		
						.75%	70,000 00	....	525 00		
						1.01%	5,000 00	....	50 50		
						1%	2,500 00	....	25 00		
								457,500 00		6,126 26	463,626 25
					Nov. 27	.677%	$282,200 00	....	$1,910 49		
						2.375%	20,000 00	....	475 00		
						3.375%	20,000 00	....	676 00		
						4.75%	20,000 00	....	950 00		
						2%	4,000 00	....	80 00		
								346,200 00		4,090 49	350,290 49
					Nov. 30	.677%	$800,000 00	....	$5,416 00		
								800,000 00		6,416 00	805,416 00
†19	1904 Jan. 20	$2,700,000 00	3½%	Nov. 1 1953	1904 Jan. 22	.077%	$1,828,300 00	....	$1,407 79		
						.63%	100,000 00	....	630 00		
						.51%	100,000 00	....	510 00		
						.41%	100,000 00	....	410 00		
						.31%	100,000 00	....	310 00		
						.21%	100,000 00	....	210 00		
Amounts carried forward.......			....	....	....	....	$2,328,300 00	$9,165,000 00	$3,477 79	$231,050 09	$9,396,050 09

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward.......	1904		....	....	 1904	....	$2,328,300 00	$9,165,000 00	$3,477 79	$231,050 09	$9,396,050 09
						.20%	10 00	....	02		
						.30%	10 00	....	03		
						.40%	10 00	....	04		
						.50%	10 00	....	05		
						.60%	10 00	....	06		
						.70%	10 00	....	07		
						.75%	10 00	....	08		
						.80%	10 00	....	08		
						.85%	10 00	....	08		
						.90%	10 00	....	09		
							....	2,328,400 00	....	....	
					Jan. 23	.50%	5,000 00	....	25 00		
						.75%	5,000 00	....	37 50		
						1%	5,000 00	....	50 00		
						1.10%	5,000 00	....	55 00		
						1.0025%	1,000 00	....	10 03		
						2%	500 00	....	10 00		
						.125%	100,000 00	....	125 00		
							....	121,500 00	....	....	
					Jan. 25	1%	100 00	....	$1 00		
							....	100 00	....	....	
Amounts carried forward.......			....	....	....	....	$2,450,000 00	$11,615,000 00	$3,791 92	$231,050 09	$9,396,050 09

CORPORATE STOCK—*Continued*

No	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
Amounts brought forward........							$2,450,000 00	$11,615,000 00	$3,791 92	$231,050 09	$9,396,050 09
	1904				1904 Jan. 28	.71%	250,000 00	....	1,775 00		
						†Averaged	....	250,000 00	....		
						rate, .238430%	$2,700 000 00		$5.566 92 (Actual)	6,437 63 (Applied)	2,706,437 63

Total Amount of Corporate Stock issued.. $11,865,000 00

Total Amount of Premium on the Issue of Corporate Stock.. $237,487 72

Total Amount of Proceeds applicable to the construction of the Manhattan-Bronx Rapid Transit Railroad of the City of New York, from January 1, 1903, to January 28, 1904.. $12,102,487 72

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*Issues of Bonds sold at par value to the Commissioners of the Sinking Fund.

†The Bond sale of January 20, 1904, amounting to $3,000,000 00, included $300,000 00 stock issued the proceeds to be applied toward the construction of the Brooklyn-Manhattan Rapid Transit Railroad, and the premiums received thereon averaged and apportioned as follows—

Total amount of Bonds sold.. $3,000,000 00

Amount to be applied to Manhattan-Bronx Construction............................ $2,700,000 00

Amount to be applied to Brooklyn-Manhattan Construction......................... $300,000 00

Total amount of premiums received on the issue of................................$3,000,000 00............... $7,152 92

Averaged rate and amount of premium as applied on the Bonds issued for Manhattan-Bronx Construction......... .238430% $6,437 63

Averaged rate and amount of premium as applied on the Bonds issued for Brooklyn-Manhattan Construction.... .238430% $715 29

MANHATTAN-BRONX CONSTRUCTION FUND

DISBURSEMENTS

Statement showing the Requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made to *John B. McDonald, Contractor,* for work done and material furnished under contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad of The City of New York, from January 1, 1903, to December 31, 1903.

Requisition	To Date		Payments Authorized			To Whom	Amount	
	1903		1903					
30.............	To January	31	February	19	As stated on page 1971 of the minutes of the Rapid Transit Commission.................	John B. McDonald, Contractor........	$553,000	00
31.............	February	28	March	12	As stated on page 2035 of said minutes......	" " "	463,000	00
32.............	March	31	April	16	" " " 2087 " "	" " "	646,000	00
33.............	April	30	May	14	" " " 2121 " "	" " "	754,000	00
34.............	May	31	June	11	" " " 2145 " "	" " "	300,000	00
35.............	June	30	July	16	" " " 2195 " "	" " "	491,000	00
36.............	July	31	August	13	" " " 2247 " "	" " "	600,000	00
37.............	August	31	September	17	" " " 2265 " "	" " "	941,000	00
38.............	September	30	October	15	" " " 2307 " "	" " "	774,000	00
39.............	October	31	November	12	" " " 2337 " "	" " "	526,000	00
40.............	November	30	December	17	" " " 2424 " "	" " "	524,000	00
			1904					
41.............	December	31	January	14	2493	....	358,000	00

Total amount paid to *John B. McDonald, Contractor,* for work done and materials furnished under contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903........ $6,930,000 00

DISBURSEMENTS—*Continued*

EXTRA WORK INCLUDING DUCTS

Statement showing the Requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board to be made to *John B. McDonald, Contractor,* for extra work done and materials furnished under contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad of The City of New York, from January 1, 1903, to December 31, 1903, pursuant to resolutions adopted by the Rapid Transit Board, and in accordance with agreements between the Contractor and the City, and the sureties to the said contract of February 21, 1900.

Requisition	To Date	Payments Authorized		To Whom	Amount	
	1902	1903				
13...............	To September 30 October 31	February 19	As stated on page 1972 of the minutes of the Rapid Transit Commission.................	John B. McDonald, Contractor........	$308,784	75
14...............	November 30 December 31	February 19	As stated on page 1973 of said minutes......	"	78,554	25
	1903					
15...............	January 31	February 19	" " " " 1973 " "	" " "	55,194	00
16...............	February 28	March 12	" " " " 2036 " "	" " "	51,814	25
17 Vaults.......	March 31	April 2	" " " " 2078 " " "	" " "	2,500	00
18...............	March 31	April 16	" " " " 2088 " " "	" " "	69,256	50
19...............	April 30	May 14	" " " " 2122 " " "	" " "	71,063	25
20...............	May 31	June 11	" " " " 2147 " " "	" " "	55,130	25
	1902					
2 Ducts........	November 1	July 16	2198	....	318,993	67
	1903					
3 Ducts........	May 31	July 16	" " " " 2199 " " "	" " "	305,577	69
21...............	June 30	July 16	" " " " 2196 " " "	" " "	56,371	75
22...............	July 31	August 13	" " " " 2248 " " "	" " "	56,547	50
23...............	August 31	September 17	" " " " 2267 " " "	" "	177,148	25
24...............	September 30	October 15	" " " " 2308 " " "	" " "	156,159	75
25...............	October 31	November 12	" " " " 2338 " " "	" " "	105,188	50
26...............	November 30	December 17	" " " " 2425 " " "	" " "	125,096	50
		1904				
4 Ducts........	November 30	January 7	" " " " 2469 " " "	" " "	222,302	61
27...............	December 31	January 14	" " " " 2494 " " "	" " "	347,338	00

Total amount paid to *John B. McDonald, Contractor,* for extra work done and materials furnished under contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad from January 1, 1903, to December 31, 1903........ $2,563,021 47

DISBURSEMENTS—*Continued*

TERMINALS

Statements showing the requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made for Terminals, under provision of the contract with *John B. McDonald, Contractor*, dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from February 21, 1900, to December 31, 1903.

Disbursements	Amount	
REAL ESTATE		
Blocks of ground bounded by One Hundred and Forty-Eighth Street, Lennox Avenue, Exterior Street, One Hundred and Fiftieth Street and Seventh Avenue, in the Borough of Manhattan, N. Y., acquired by deed of conveyance to The City of New York from the Rapid Transit Subway Construction Co., dated December 18, 1903, and recorded in the office of the Register of the County of New York, December 24, 1903, in Sec. 6, Liber, 83, page 59 of conveyances. Title being insured by the Lawyers' Title Insurance Co., of N. Y., by title policy No. 174,655, dated December 23, 1903, said deed and title policy being in the custody of the City Comptroller. Payment made under the direction of the Rapid Transit Board..........	$1,048,251	72
Total amount paid for Terminals, under provision of the contract with *John B. McDonald Contractor*, dated February 21. 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from February 21, 1900, to December 31, 1903..........	$1,048,251	72

DISBURSEMENTS—*Continued*

REAL ESTATE

Statements showing the requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made for Real Estate acquired, for and in behalf of the City of New York, under provision of the contract with *John B. McDoonald, Contractor,* dated February 21, 1900, for the construction and operation of the Manhatan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903.

Disbursements.		Amount.
ADVERTISING.		
Advertising public notices in the matter of the application and petition of the Board of Rapid Transit Railroad Commissioners, for the appointment of Commissioners of Appraisal by the Supreme Court, First Judicial Department, relative to acquiring a perpetual underground right, easement, and right of way under lands situated on the easterly side of Broadway, between One Hundred and Third and One Hundred and Fourth Streets in the Borough of Manhattan, N. Y.		$562 80
CLERICAL SERVICE.		
Stenographic services rendered the Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department, relative to lands in Broadway, between One Hundred and Twenty-second and One Hundred and Thirty-fifth Streets in the Borough of Manhattan, N. Y.		1,248 65
Compensation of Clerk to the Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department, relative to lands in Broadway, between One Hundred and Twenty-second and One Hundred and Thirty-fifth Streets, in the Borough of Manhattan, N. Y.		1,200 00
The City of New York—reimbursement of a fund for expenses of Commissioners of Estimate and Appraisal for Clerks, etc.; Services rendered the Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department, relative to lands situated, viz.:		
North East Corner Broadway and Forty-second Street in the Borough of Manhattan, N. Y.	$150 00	
Easterly side of Broadway, between One Hundred and Third and One Hundred and Fourth Streets in the Borough of Manhattan, N. Y.	177 60	327 60
Amount carried forward		$3,339 05

REAL ESTATE—*Continued*

DISBURSEMENTS.		AMOUNT.
Amount brought forward		$3,339 05
EXPERT SERVICE.		
Compensation and Expenses of Consulting Experts in the matter of testimony before Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department, relative to lands situated, viz.:		
Broadway, between One Hundred and Twenty-second and One Hundred and Thirty-fifth Streets in the Borough of Manhattan, N. Y.	$5,000 00	
Easterly side of Broadway, between One Hundred and Third and One Hundred and Fourth Streets in the Borough of Manhattan, N. Y.	475 00	5,475 00
COMMISSIONERS OF APPRAISAL.		
Compensation for Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department, relative to acquiring perpetual underground rights, easements, and right of way under lands situated, viz.:		
North East corner Broadway and Forty-second Street in the Borough of Manhattan, N. Y.	$940 00	
Easterly side of Broadway, between One Hundred and Third and One Hundred and Fourth Streets in the Borough of Manhattan, N. Y.	580 00	1,520 00
REAL ESTATE.		
Easement Property North East corner Broadway and Forty-second Street, viz.: Awards, Rentals and other expenditures made in the acquirement of easement property in perpetuity, pursuant to the reports of the Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department, relative to lands situated at the North East corner of Broadway and Forty-second Street in the Borough of Manhattan, N. Y., dated respectively May 15, 1903, and June 23, 1903, and confirmed by orders of said Supreme Court dated May 18, 1903, and June 25, 1903.		
Payments made under the direction of the Rapid Transit Board	$89,874 26	
Rebatement of Rentals, and proceeds of the sale of old material, transmitted to the City Comptroller.	11,021 30	78,852 96
Amount carried forward		$89,187 01

REAL ESTATE—*Continued*

DISBURSEMENTS	AMOUNT.	
Amount brought forward	89,187	01
REAL ESTATE—CONTINUED.		
Easement Property, Broadway, Seventh Avenue and Long Acre Square, between Forty-second and Forty-third Streets in the Borough of Manhattan, N. Y., acquired in perpetuity by deed of conveyance to The City of New York from The Subway Realty Co., of N. Y., dated February 4, 1903, and recorded in the office of the Register of the County of New York February 27, 1903, in Sec. 4, Liber. 92, page 89 of conveyances. Title being insured by the Lawyers' Title Insurance Co., of New York, by title policy No. 14,227, dated February 25, 1903, said deed and title policy being in the custody of the City Comptroller. Payment made under the direction of the Rapid Transit Board	59,000	00
Fee paid the Lawyers' Title Insurance Co. for examination and Insurance of Title	150	00
Easement Property, Broadway, between One Hundred and Third and One Hundred and Fourth Streets, viz.: Award made in the acquirement of easement property in perpetuity, pursuant to the report of the Commissioners of Appraisal appointed by the Supreme Court, First Judicial Department,, relative to lands situated on the easterly side of Broadway, between One Hundred and Third and One Hundred and Fourth Streets in the Borough of Manhattan, N. Y., dated June 26, 1903, and confirmed by order of said Supreme Court, dated July 30, 1903. Payment made under the direction of the Rapid Transit Board	9,367	50
Easement Properties, One Hundred and Forty-ninth Street and Harlem River, One Hundred and Forty-second Street and Lenox Avenue, One Hundred and Fourth Street and Broadway, Hillside and Eleventh Avenues, and at Elm and Worth Streets in the Boroughs of The Bronx and Manhattan, N. Y., to be acquired in perpetuity in accordance with an agreement between the Interborough Rapid Transit Company and the Board of Rapid Transit Railroad Commissioners for and in behalf of The City of New York, pursuant to a resolution of the said Rapid Transit Board, adopted June 25, 1903. Payment made upon account of the price of said easements	354,300	39
Total amount paid for Real Estate acquired under provision of the contract with *John B. McDonald, Contractor*, dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903	$512,004	90

DISBURSEMENTS—*Continued*

INTEREST ON CORPORATE STOCK

Statement showing the payments made under the direction of the City Comptroller, for interest due on the Corporate Stock issued by The City of New York, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903.

No.	For What	Due	Amount
6	The payment of interest due on the Corporate Stock issued by The City of New York, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad........	May 1, 1903	$439,303 62
7	The payment of interest due on the Corporate Stock issued by The City of New York, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad........	November 1, 1903	508,177 94
	Total amount in interest paid on the Corporate Stock issued by The City of New York, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad from January 1, 1903, to December 31, 1903........		$947,481 56

MANHATTAN-BRONX CONSTRUCTION FUND

SUMMARY OF DISBURSEMENTS

For work done and materials furnished, pursuant to contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903........	$6,930,000 00
For extra work done and materials furnished (including ducts), pursuant to agreement for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903........	2,563,021 47
For terminals, under provision of the contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from February 21, 1900, to December 31, 1903........	1,048,251 72
For Real Estate acquired under the provision of the contract dated February 21, 1900, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903........	512,004 90
For interest due on Corporate Stock issued by the City of New York, for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to December 31, 1903........	947,481 56
Total amount of Manhattan-Bronx Construction Fund disbursements from January 1, 1903, to December 31, 1903........	$12,000,759 65

BROOKLYN-MANHATTAN CONSTRUCTION FUND

CORPORATE STOCK

Statement showing the issue of Corporate Stock of The City of New York, from July 21, 1902, to January 25, 1904, the proceeds thereof to be applied to the construction of the Brooklyn-Manhattan Rapid Transit Railroad.

No.	Date of Sale	Issue	Interest Rate	Maturity	ISSUE OF STOCK.						Amount of Proceeds Credited
					Date	Rate of Premium	Amount Issued	Total	Amount of Premium	Total	
*1	1903 Aug. 27	$1,000 00	3½	Nov. 1 1952	1903 Aug. 27	....	$1,000 00	.... $1,000 00	....	....	$1,000 00
†2	1904 Jan. 20	$300,000 00	3½	Nov. 1 1953	1904 Jan. 25	.836	$100,000 00	....	$836 00		
						.25	100,000 00	....	250 00		
						.50	100,000 00	....	500 00		
						Averaged rate, .238430%	....	300,000 00	$1,586 00 (Actual)	$715 29 (Applied)	300,715 29

Total Amount of Corporate Stock issued....................$301.000 00

Total Amount of Premium on the Issue of Corporate Stock....................$715 29

Total Amount of Proceeds applicable to the construction of the Brooklyn-Manhattan Rapid Transit Railroad of The City of New York from July 21, 1902, to January 25, 1904....................$301,715 29

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*Issue of Bonds sold at par value to the Commissioners of the Sinking Fund.

†The Bond sale of January 20, 1904, amounting to $3,000,000 00, included $2,700,000 00 stock issued, the proceeds to be applied towards the construction of the Manhattan-Bronx Rapid Transit Railroad, and the premiums received thereon averaged and apportioned as follows:

Total amount of Bonds sold...$3,000,000 00

Amount to be applied to Brooklyn-Manhattan construction.............................. $300,000 00
Amount to be applied to Manhattan-Bronx construction.............................. 2,700,000 00

Total amount of premiums received on the issue of............................$3,000,000 00................ $7,152 92

Averaged rate and amount of premium as applied on the Bonds issued for Brooklyn-Manhattan construction... .238430% $715 29
Averaged rate and amount of premium as applied on the Bonds issued for Manhattan-Bronx construction....... .238430% $6,437 63

BROOKLYN-MANHATTAN CONSTRUCTION FUND

DISBURSEMENTS

Statement showing the Requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made to *Rapid Transit Subway Construction Company, Contractor*, for work done and materials furnished under contract dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad of The City of New York, from July 21, 1902, to December 31, 1903.

Requisition	To Date	Payments Authorized		To Whom	Amount
	1903	1903			
1...........	To October 31	November 24	As stated on page 2364 of the minutes of the Rapid Transit Commission..............	Rapid Transit Subway Construction Co.	$112,229 86
2...........	November 30	December 17	As stated on page 2426 of said minutes.......	" " " " "	47,205 36
		1904			
3...........	December 31	January 14	" " " " 2496 " " "	" " " " "	43,021 84

Total amount paid to Rapid Transit Subway Construction Company, for work done and materials furnished under contract dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903	$202,457 06

DISBURSEMENTS—*Continued*

REAL ESTATE

Statement showing the Requisitions made upon the Board of Rapid Transit Railroad Commissioners, and the payments authorized under the direction of the said Rapid Transit Board, to be made for Real Estate acquired, for and in behalf of The City of New York, under provision of the contract with *Rapid Transit Subway Construction Company, Contractor,* dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903.

Year	Disbursements	Amount
	ADVERTISING	
1903	Advertising public notices in the matter of the application and petition of the Board of Rapid Transit Railroad Commissioners, for the appointment of Commissioners of Appraisal by the Supreme Court, Second Judicial District, relative to acquiring a perpetual underground right, easement, and right of way under Joralemon and other streets in the Borough of Brooklyn, N. Y.—Application for the appointment of a Commissioner in the place and stead of one previously appointed, who refused to serve as such Commissioner.	$116 80
	CLERICAL SERVICE.	
1903	Compensation of Clerk to the Commissioners of Appraisal appointed by the Supreme Court, Second Judicial District, relative to acquiring a perpetual underground right, easement, and right of way under Joralemon and other streets in the Borough of Brooklyn, N. Y.	590 00

Total amount paid for Real Estate acquired under provision of the contract with *Rapid Transit Subway Construction Company, Contractor*, dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903. $706 80

DISBURSEMENTS—*Continued*

INTEREST ON CORPORATE STOCK

Statement showing the payments made under the direction of the City Comptroller, for interest due on the Corporate Stock issued by The City of New York, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903.

No.	For What	Due	Amount
1	The payment of interest due on the Corporate Stock issued by The City of New York, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad..................................	November 1, 1903	$5 87
	Total amount in interest paid, on the Corporate Stock issued by The City of New York, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903..		$5 87

BROOKLYN-MANHATTAN CONSTRUCTION FUND

SUMMARY OF DISBURSEMENTS

For work done and materials furnished pursuant to contract dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903	$202,457 06
For Real Estate acquired under provision of the contract dated July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903	706 80
For interest due on Corporate Stock issued by The City of New York, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to December 31, 1903	5 87
Total amount of Brooklyn-Manhattan Construction Fund disbursements from July 21, 1902, to December 31, 1903................	$203,169 73

GENERAL FUND—BALANCES

Statement showing the yearly balances of the General Fund, 1902—1903.

Year	Appropriations		Disbursements	Excess Disbursements chargeable to the unexpended balance of previous appropriations.	Surplus applicable with the present appropriation.
1902	$101,562 69	Unexpended Balance of the General Fund, December 31, 1902....	....	.. ..	$101,562 69
1903	542,000 00	Appropriations made by the Board of Estimate and Apportionment for the purposes of the Board of Rapid Transit Railroad Commissioners from January 1, 1903, to December 31, 1903:			
1903	....	Administrative and General Office Disbursements........ 45,719 42			
		Engineering Disbursements.............................. 520,664 27			
		Legal Disbursements.. 24,332 55	590,716 24	$48,716 24	....
		Unexpended Balance of the General Fund, December 31, 1903...	52,846 45	52,846 45	....
	$643,562 69		$643,562 69	$101,562 69	$101,562 69

MANHATTAN-BRONX CONSTRUCTION FUND—Balances.

Statement showing the yearly balances of the Manhattan-Bronx Construction Fund, 1902-1903.

Year	Amount of Proceeds of Corporate Stock Issued			Disbursements	Surplus applicable with the proceeds of the Current Stock Issue
1902	$924,472 68	Unexpended Balance of the General Fund, December 31, 1902		....	$924,472 68
1903	12,102,487 72	Amount of Proceeds of Corporate Stock issued by The City of New York for the construction and operation of the Manhattan-Bronx Rapid Transit Railroad, from January 1, 1903, to January 28, 1904		....	....
1903	....	Disbursements, viz., Manhattan-Bronx Rapid Transit Railroad			
		For work done and materials furnished	$6,930,000 00		
		For extra work done and materials furnished	2,563,021 47		
		For Terminals	1,048,251 72		
		For Real Estate	512,004 90		
		For Interest on the Corporate Stock	947,481 56	$12,000,759 65	101,728 07
		Unexpended Balance on the Manhattan-Bronx Construction Fund, December 31, 1903.		1,026,200 75	....
	$13,026,960 40			$13,026,960 40	$1,026,200 75

BROOKLYN-MANHATTAN CONSTRUCTION FUND—Balances.

Statement showing the yearly balance of the Brooklyn-Manhattan Construction Fund 1903.

Year	Amount of Proceeds of Corporate Stock Issued Disbursements			Disbursements	Surplus applicable with the proceeds of the Current Stock Issue
1903	$301,715 29	Amount of Proceeds of Corporate Stock issued by The City of New York for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, from July 21, 1902, to January 25, 1904			
1903	....	Disbursements, viz., Brooklyn-Manhattan Rapid Transit Railroad:			
		For work done and materials furnished	$202,457 06		
		For Real Estate	706 80		
		For Interest on Corporate Stock	5 87	$203,169 73	
		Unexpended Balance of the Brooklyn-Manhattan Construction Fund, December 31, 1903		98,545 56	98,545 66
	$301,715 29			$301,715 29	$98,545 56

SECURITIES.

Statement of the Securities deposited by the *Rapid Transit Subway Construction Company* at the time of execution of the contract of February 21, 1900, for the construction and operation of the (Manhattan-Bronx) Rapid Transit Railroad, and including supplementary securities deposited September 24, 1902, as additional security for the performance of the provisions of the Bond for Rental and Construction, remaining in the custody of The Comptroller of The City of New York, December 31, 1903.

Bonds and Stock Registered in the Name of "The Comptroller of The City of New York, in Trust as Security for John B. McDonald, Rapid Transit Railroad Constructor."

$270,000	3% Illinois Central Railroad Company, St. Louis Division and Terminal First Mortgage Gold Bonds (Nos. 80 to 99, inclusive, 1510 to 1596, inclusive, 2646, 2652 to 2657, inclusive, 3486 to 3536, inclusive, 3587 to 3618, inclusive, 3626 to 3681, inclusive, 4155, and 4318 to 4333, inclusive, for $1,000 each). Principal payable July 1, 1951. Interest payable January 1 and July 1.
100,000	3% School House Bonds of The City of New York. Principal payable November 1, 1908. Interest payable May 1 and November 1.
200,000	3% Dock Bonds of The City of New York. Principal payable November 1, 1924. Interest payable May 1 and November 1.
100,000	3% Additional Water Stock of The City of New York. Principal payable October 1, 1907. Interest payable April 1 and October 1.
100,000	3% Dock Bonds of The City of New York. Principal payable November 1, 1914. Interest payable May 1 and November 1.
$770,000	*Amount carried forward.*

SECURITIES.—*Continued.*

$770,000	*Amount brought forward.*
250,000	3½% Corporate Stock of The City of New York for the New Aqueduct. Principal payable October 1, 1919. Interest payable April 1 and October 1.
* 5,000	3% Corporate Stock of The City of New York for the repaving of streets. Principal payable November 1, 1940. Interest payable May 1 and November 1.
$1,025,000	

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* Deposited September 24, 1902.

SECURITIES.

Statement of the Securities deposited by the *Rapid Transit Subway Construction Company,* January, 1901, under provision of the contract of February 21, 1900, for the construction and operation of the (Manhattan-Bronx) Rapid Transit Railroad and including supplementary securities deposited September 24, 1902, as security for Construction and Equipment, remaining in the custody of The Comptroller of The City of New York, December 31, 1903.

BONDS AND STOCK REGISTERED IN THE NAME OF "THE COMPTROLLER OF THE CITY OF NEW YORK, IN TRUST AS SECURITY FOR JOHN B. McDONALD, RAPID TRANSIT RAILROAD CONSTRUCTOR."

$30,000	3% Additional Water Stock of The City of New York. Principal payable October 1, 1905. Interest payable April 1, and October 1.
20,000	3% Consolidated Stock of The City of New York for acquiring lands for Mulberry Bend Park. Principal payable November 1, 1924. Interest payable May 1 and November 1.
50,000	3% Dock Bonds of The City of New York. Principal payable November 1, 1925. Interest payable May 1 and November 1.
15,000	3½% Consolidated Stock of The City of New York for the New East River Bridge. Principal payable November 1, 1918. Interest payable May 1 and November 1.
30,000	3½% Corporate Stock of The City of New York for the New Aqueduct. Principal payable October 1, 1919. Interest payable April 1 and October 1.
25,000	3½% Corporate Stock of the City of New York for School Houses and Sites therefor in the Boroughs of Manhattan and the Bronx. Principal payable November 1, 1940. Interest payable May 1 and November 1.
$170,000	*Amount carried forward.*

SECURITIES.—*Continued.*

$170,000	*Amount brought forward.*
100,000	3½% Corporate Stock of The City of New York for the Uses and Purposes of the Department of Docks and Ferries. Principal payable November 1, 1928. Interest payable May 1 and November 1.
237,000	3½% Corporate Stock of The City of New York for the Construction of the Rapid Transit Railroad. Principal payable November 1, 1950. Interest payable May 1 and November 1.
*30,000	3½% Corporate Stock of The City of New York for the repaving of streets. Principal payable November 1, 1940. Interest payable May 1 and November 1.
	COUPON BONDS.
250,000	3% Chicago & Alton Railroad Company refunding 50 years Gold Bonds (Nos. 15115 to 15364, inclusive, for $1,000 each). Principal payable October 1, 1949. Interest payable April 1 and October 1.
251,000	3% Illinios Central Railroad Company, Litchfield Division, First Mortgage Gold Bonds (Nos. 751 to 1,000, inclusive, and 1,500, for $1,000 each). Principle payable January 1, 1951. Interest payable January 1 and July 1.
$1,038,000	

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* Deposited September 24, 1902.

SECURITIES.

Statement of Securities deposited with the Comptroller of The City of New York, by *The Rapid Transit Subway Construction Company,* as a continuing deposit of Securities in lieu of the deposit of One Million Dollars in cash, in accordance with the contract of July 21, 1902, for the construction and operation of the Brooklyn-Manhattan Rapid Transit Railroad, remaining in the custody of City Comptroller December 31, 1903.

BONDS AND STOCK REGISTERED IN THE NAME OF "THE COMPTROLLER OF THE CITY OF NEW YORK, IN TRUST AS SECURITY FOR THE RAPID TRANSIT SUBWAY CONSTRUCTION COMPANY, BROOKLYN-MANHATTAN RAPID TRANSIT RAILROAD CONSTRUCTORS."

$200,000	3½% Corporate Stock of The City of New York for New East River Bridge. Gold. Tax Exempt. Registered. Principal payable November 1, 1929. Interest payable May 1 and November 1.
200,000	3½% Corporate Stock of the City of New York for Docks and Ferries. Gold. Tax Exempt. Registered. Principal payable November 1, 1929. Interest payable May 1 and November 1.
200,000	3½% Consolidated Stock of The City of New York for Redemption of Bonds and Stock maturing in the year 1896. Gold. Tax Exempt. Registered. Principal payable November 1, 1922. Interest payable May 1 and November 1.
200,000	3% Additional Water Stock of The City of New York. Gold. Tax Exempt. Registered. Principal payable October 1, 1905. Interest payable April 1 and October 1. Interest payable April 1 and October 1.
142,000	3% Additional Water Stock of The City of New York. Gold. Tax Exempt. Registered. Principal payable October 1, 1907. Interest payable April 1 and October 1.
58,000	3% Consolidated Stock of The City of New York, for Bridge over the Harlem River. Gold. Tax Exempt. Registered. Principal payable November 1, 1907. Interest payable May 1 and November 1.
$1,000,000	

RECAPITULATION

BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS

GENERAL FUND

1894-1903

REQUISITIONS AND APPROPRIATIONS

Total amount of Requisitions made upon the Board of Estimate and Apportionment for the requirements of the Board of Rapid Transit Railroad Commissioners during the period of:—

1894.	Amount of Requisitions		$5,000 00
1895.	" " "	$89,434 75	
	Aggregate appropriation made by the Board of Estimate and Apportionment in excess of the amount of the original requisitions	1816 31	91,251 06
1896.	Amount of Requisitions		66,947 93
1897.	" " "	$94,482 21	
	Aggregate appropriation made by the Board of Estimate and Apportionment reduced to suffice the purposes of the original requisitions	14,433 04	80,049 17
1898.	Amount of Requisitions	42,943 37	
	Aggregate appropriation made by the Board of Estimate and Apportionment reduced to suffice the purposes of the original requisitions	5,869 55	37,073 82
1899.	Amount of Requisitions		27,625 33
1900.	" " "		246,393 28
1901.	" " "		423,521 60
1902.	" " "		613,500 00
1903.	" " "	$572,000 00	
	Re-appropriation. No bonds to be issued.	30,000 00	542,000 00

Total amount of Requisitions made upon the Board of Estimate and Apportionment from 1894 to 1903, inclusive $2,133,362 19

Total amount of Appropriations made by the Board of Estimate and Apportionment for the purposes of the Board of Rapid Transit Railroad Commissioners during the period of:—

1894.	Amount of Appropriations	$5,000 00
1895.	" " "	53,795 88
1896.	" " "	102,135 60
1897.	" " "	66,009 59
1898.	" " "	53,380 91
1899.	" " "	27,625 33
1900.	" " "	246,393 28
1901.	" " "	423,521 60
1902.	" " "	613,500 00
1903.	" " "	542,000 00

Total amount of Appropriations to the General Fund from 1894 to 1903, inclusive $2,133,362 19

GENERAL FUND
1894-1903

DISBURSEMENTS

Total amount of Disbursements made under the direction of the Board of Rapid Transit Railroad Commissioners during the period of:——

		Administrative and General Office	Engineering	Legal	Total
..1894.	Amount of Disbursements....	$2,929 10	$1,271 34	$28 30	$4,228 74
..1895.	" " "	6,048 49	26,250 29	25,688 13	57,986 91
..1896.	" " "	35,572 34	17,028 82	31,457 53	84,058 69
..1897.	" " "	5,230 06	21,395 86	38,925 73	65,551 65
..1898.	" " "	4,521 15	17,930 31	29,519 13	51,970 59
..1899.	" " "	2,826 94	3,698 00	20,551 30	27,076 24
..1900.	" " "	53,866 33	161047 23	27,356 19	242,269 75
..1901.	" " "	39,023 86	348,258 30	31,861 62	419,143 78
..1902.	" " "	45,576 10	458,389 79	33,547 26	537,513 15
..1903.	" " "	45,719 42	520,664 27	24,332 55	590,716 24
		$241,313,79	$1,575,934 21	$263,267 74	

Total amount of General Fund Disbursements, from 1894 to 1903, inclusive $2,080,515 74

CORPORATE STOCK

1894-1903

MANHATTAN–BRONX CONSTRUCTION FUND

Total amount of Proceeds credited of the Corporate Stock issued by The City of New York for the construction of the Manhattan-Bronx Rapid Transit Railroad during the period of:——

Year			Proceeds
1900.	Amount of Stock issued......	$1,000,000 00	
	" " Premium.........	105,400 00	
			$1,105,400 00
1901.	Amount of Stock issued......	$11,000,000 00	
	" " Premium.........	635,361 46	
			11,635,361 46
1902.	Amount of Stock issued......	$12,500,000 00	
	" " Premium.........	803,663 70	
			13,303,663 70
1903.	Amount of Stock issued......	$11,865,000 00	
	" " Premium.........	237,487 72	
			12,102,487 72
Total amount of Proceeds applicable to the construction of the Manhattan-Bronx Rapid Transit Railroad, from 1900 to 1903, inclusive..............................			$38,146,912 88

BROOKLYN–MANHATTAN CONSTRUCTION FUND

Total amount of Proceeds credited of the Corporate Stock issued by The City of New York for the construction of the Brooklyn - Manhattan Rapid Transit Railroad during the period of:......

Year			
1903.	Amount of Stock issued......	$301,000 00	
	" " Premium.........	715 29	
			$301,715 29
Total amount of Proceeds applicable to the construction of the Brooklyn-Manhattan Rapid Transit Railroad from 1902 to 1903, inclusive..............................			$301,715 29

CONSTRUCTION FUND

1894-1903

DISBURSEMENTS

MANHATTAN-BRONX CONSTRUCTION FUND

Total amount of Disbursements made in the construction of the Manhattan-Bronx Rapid Transit Railroad during the period;——

		Work and Materials	Extra Work and Materials	Terminals	Real Estate	Interest on Corporate Stock	Total
1900.	Amt. of Disbursements.	$1,685,000 00	....	....	....	....	$1,685,000 00
1901.	" " "	$10,343,000 00	$162,000 00	....	$9,515 45	$165,013 90	10,679,529 35
1902.	" " "	11,436,000 00	631,000 00	....	141,391 72	547,031 41	12,755,423 13
1903.	" " "	6,930,000 00	2,563,021 47	$1,048,251 72	512,004 90	947,481 56	12,000,759 65
		$30,394,000 00	$3,356,021 47	$1,048,251 72	$662,912 07	$1,659,526 87	

Total amount of Manhattan-Bronx Construction Fund Disbursements from 1900 to 1903, inclusive......$37,120,712 13

BROOKLYN-MANHATTAN CONSTRUCTION FUND

Total amount of disbursements made in the construction of the Brooklyn-Manhattan Rapid Transit Railroad during the period:——

		Work and Materials	Real Estate	Interest on Corporate Stock	Total
1903.	Amount of Disbursements.......	$202,457 06	706 80	5 87	

Total amount of Brooklyn-Manhattan Construction Fund Disbursements from 1902 to 1903, inclusive.... $203,169 73

BOARD OF RAPID TRANSIT RAILROAD COMMISSIONERS

THE CITY OF NEW YORK

SUMMARY OF DISBURSEMENTS

1894-1903

Total amount of General Fund Disbursements	$2,080,515 74
Total amount of Manhattan-Bronx Construction Fund Disbursements	37,120,712 13
Total amount of Brooklyn-Manhattan Construction Fund Disbursements	203,169 73
Total amount disbursed by the Board of Rapid Transit Railroad Commissioners, from June 18, 1894, to December 31, 1903	$39,404,397 60

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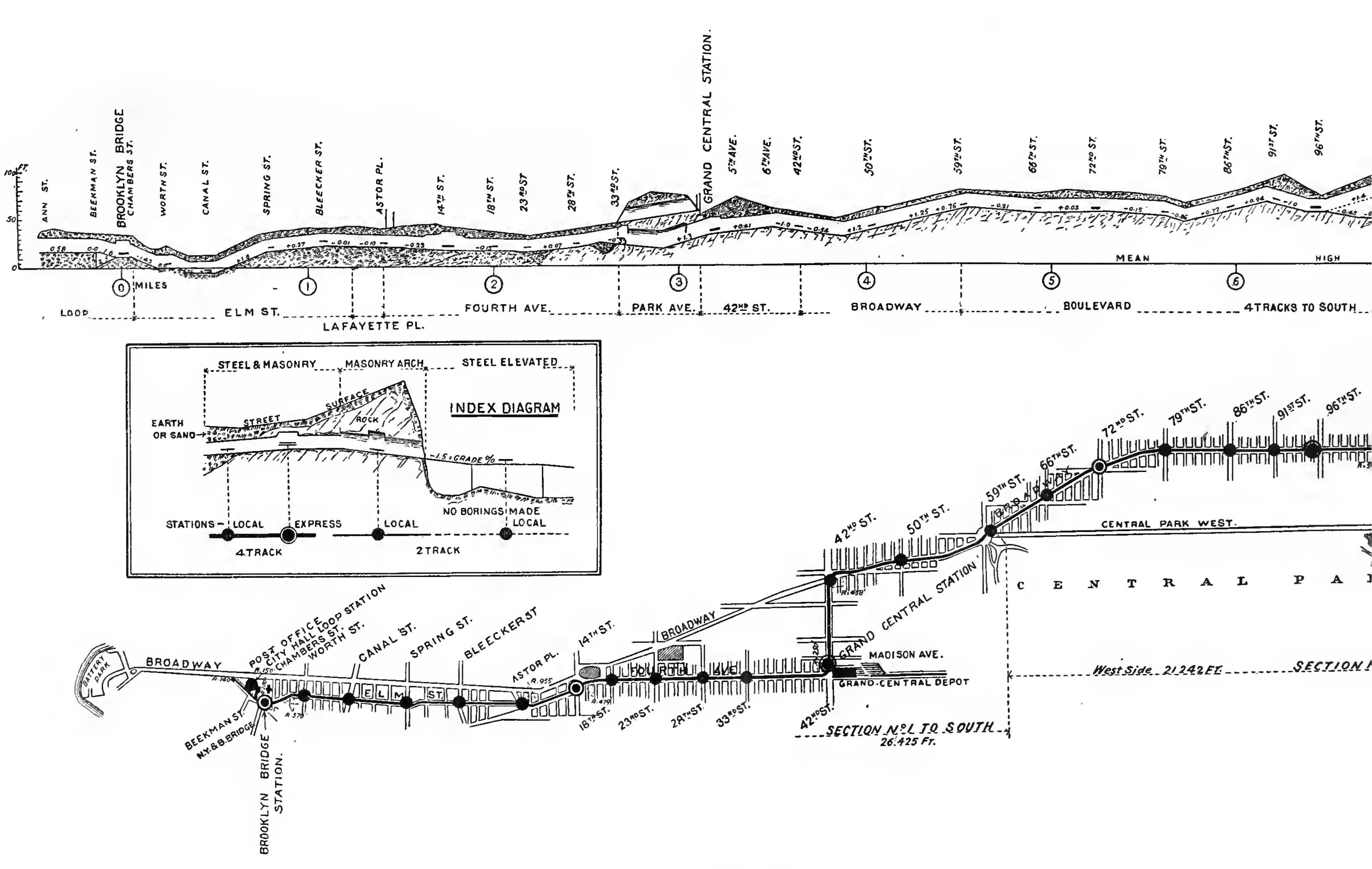


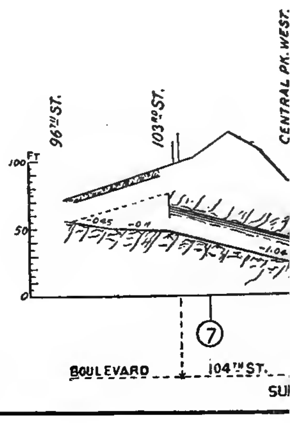
RAPID TRANSIT COMMISSION

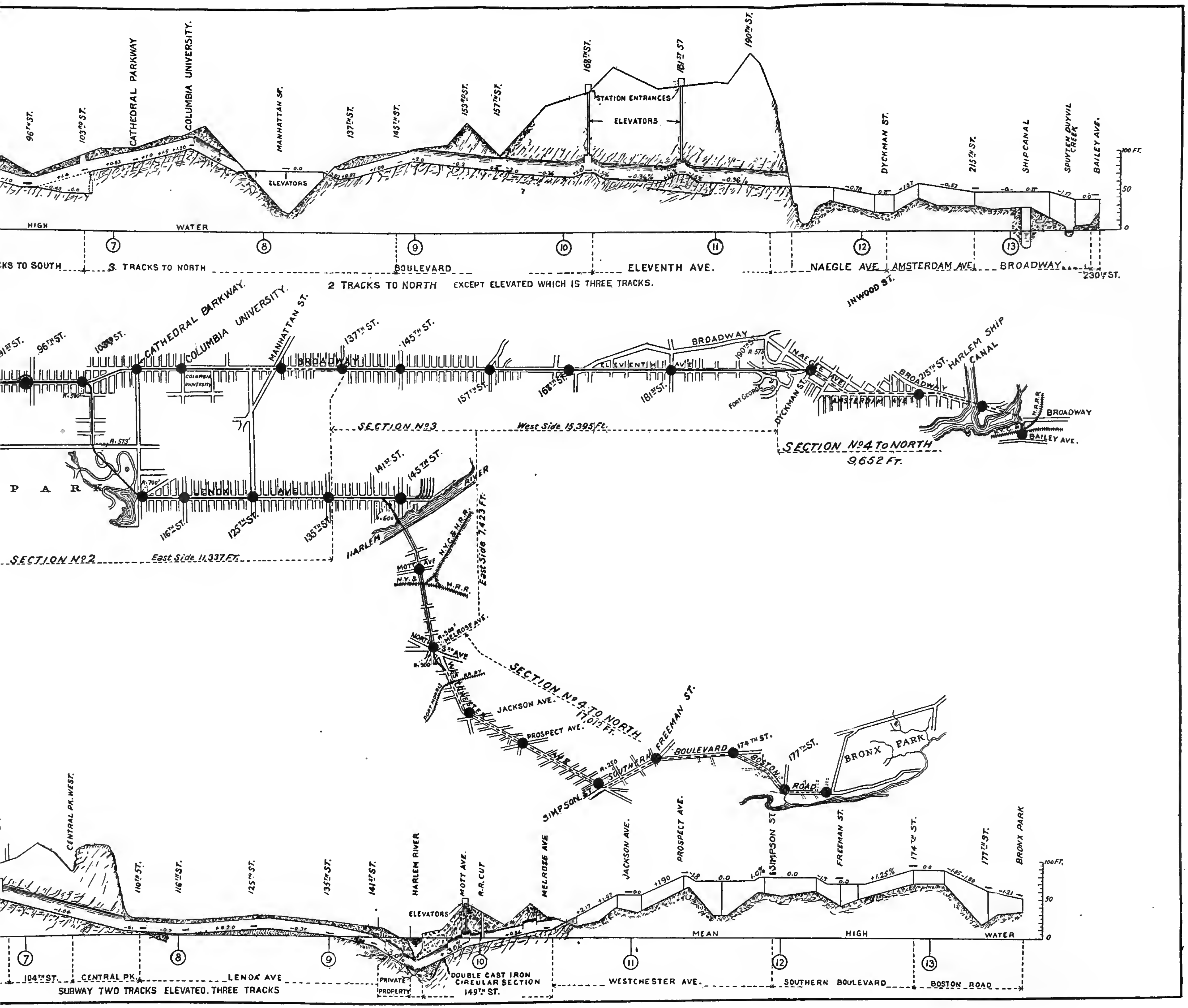
MAP AND PROFILE
OF
RAILWAY

SHOWN BY CONTRACT DRAWINGS
DATED APRIL 7TH 1898.

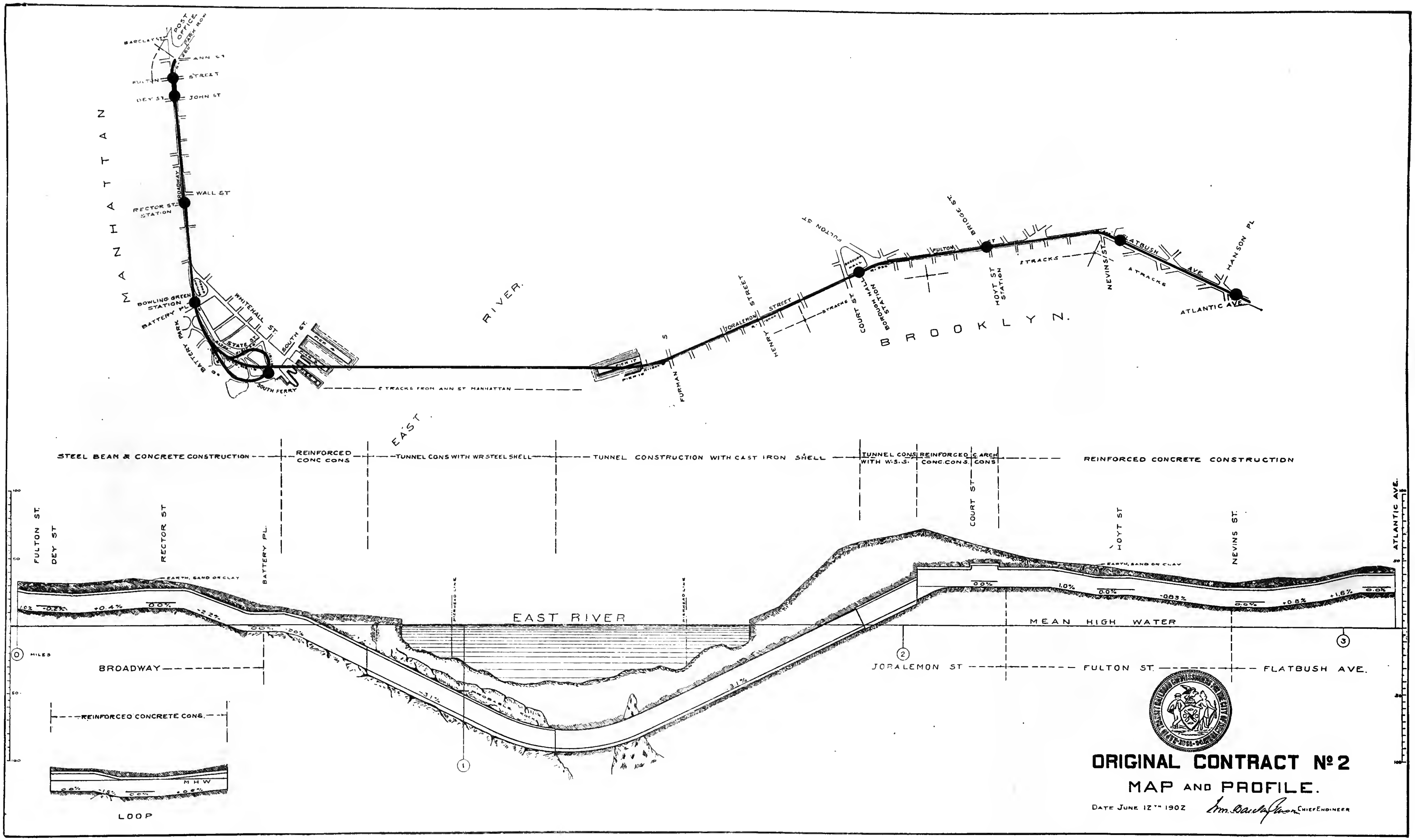
CORRECTED TO DEC. 31ST 1903.

Wm. Barclay Parsons Chief Engineer.





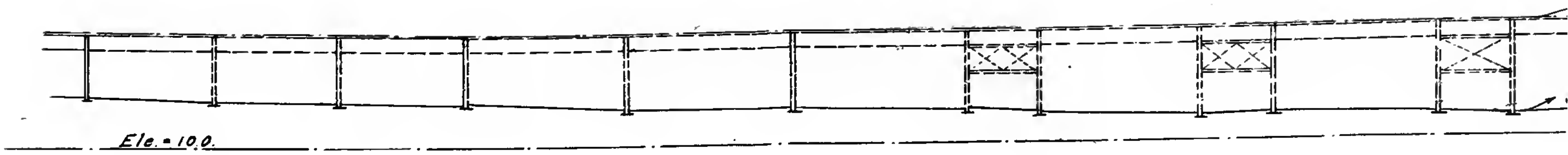
96TH ST.
103RD ST.
CATHEDRAL PARKWAY
COLUMBIA UNIVERSITY.
MANHATTAN ST.
137TH ST.
145TH ST.
153RD ST.
157TH ST.
168TH ST.
181ST ST.
190TH ST.
STATION ENTRANCES
ELEVATORS
DYCKMAN ST.
215TH ST.
SHIP CANAL
SPUYTEN DUYVIL CREEK
BAILEY AVE.
100 FT.
50
0
HIGH
WATER
7
8
9
10
11
12
13
KS TO SOUTH
3. TRACKS TO NORTH
BOULEVARD
ELEVENTH AVE.
NAEGLE AVE
AMSTERDAM AVE.
BROADWAY
230TH ST.
2 TRACKS TO NORTH EXCEPT ELEVATED WHICH IS THREE TRACKS.
INWOOD ST.
BROADWAY
ELEVENTH AVE
FORT GEORGE
HARLEM SHIP CANAL
N.Y.C. & H.R.R.
SECTION No. 3
West Side 15,395 Ft.
SECTION No. 4 TO NORTH
9,652 FT.
P A R K
LENOX AVE
116TH ST.
125TH ST.
135TH ST.
141ST ST.
HARLEM RIVER
SECTION No. 2
East Side 11,337 FT.
East Side 7,423 Ft.
MOTT AVE
N.Y. & H.R.R.
N.Y.C. & H.R.R.
MELROSE AVE.
NORTH
3RD AVE
WESTCHESTER
JACKSON AVE.
PROSPECT AVE.
SECTION No. 4 TO NORTH
17,012 FT.
SIMPSON ST.
SOUTHERN BOULEVARD
FREEMAN ST.
174TH ST.
BOSTON ROAD
177TH ST.
BRONX PARK
CENTRAL PK. WEST.
110TH ST.
116TH ST.
125TH ST.
135TH ST.
141ST ST.
HARLEM RIVER
MOTT AVE.
R.R. CUT
MELROSE AVE
JACKSON AVE.
PROSPECT AVE.
SIMPSON ST.
FREEMAN ST.
174TH ST.
177TH ST.
BRONX PARK
ELEVATORS
MEAN
HIGH
WATER
104TH ST.
CENTRAL PK.
LENOX AVE
PRIVATE PROPERTY
DOUBLE CAST IRON CIRCULAR SECTION
149TH ST.
WESTCHESTER AVE.
SOUTHERN BOULEVARD
BOSTON ROAD
SUBWAY TWO TRACKS ELEVATED. THREE TRACKS

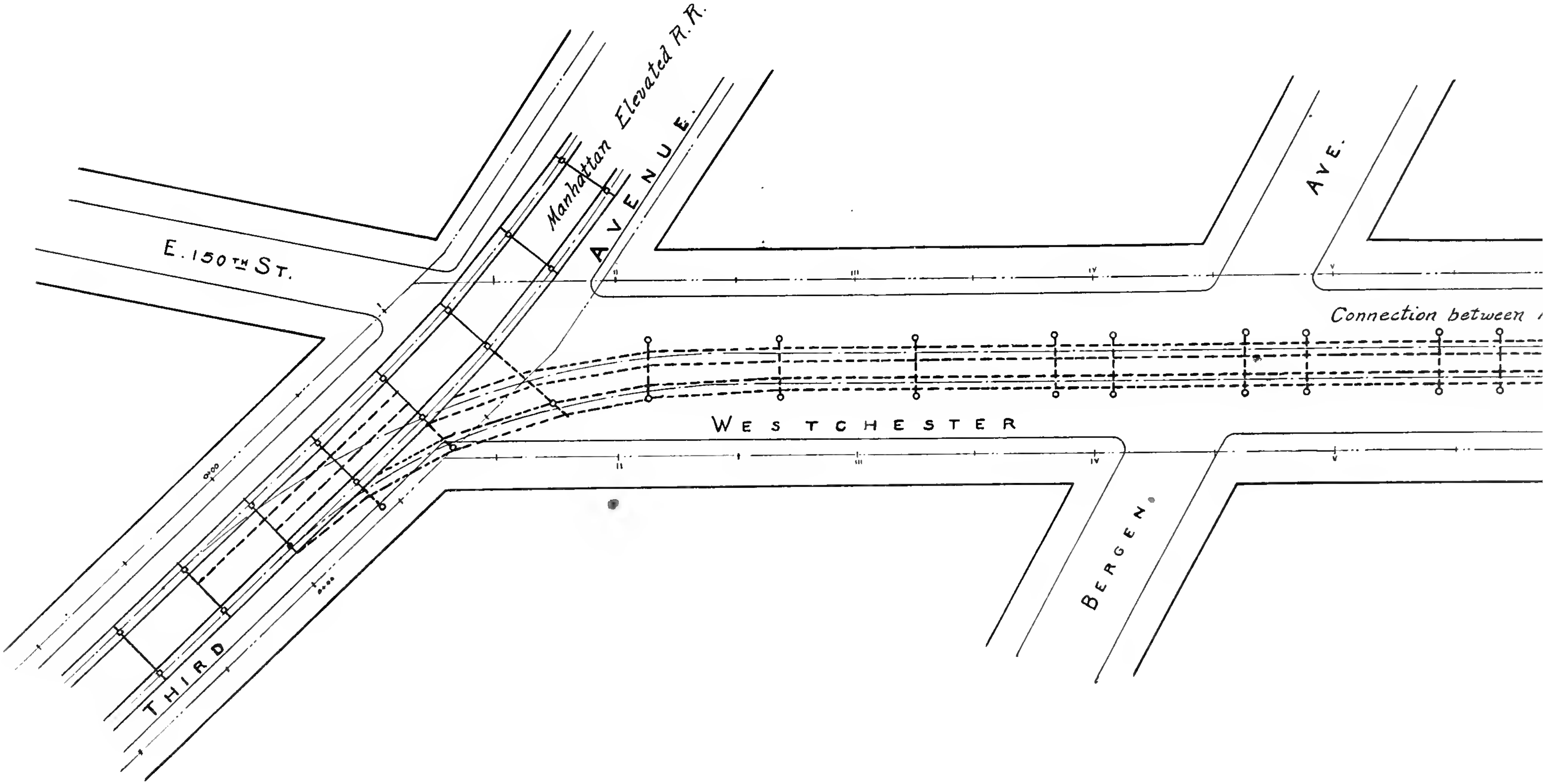


ORIGINAL CONTRACT No 2

MAP AND PROFILE.

Date June 12th 1902 Wm. Barclay Parsons Chief Engineer

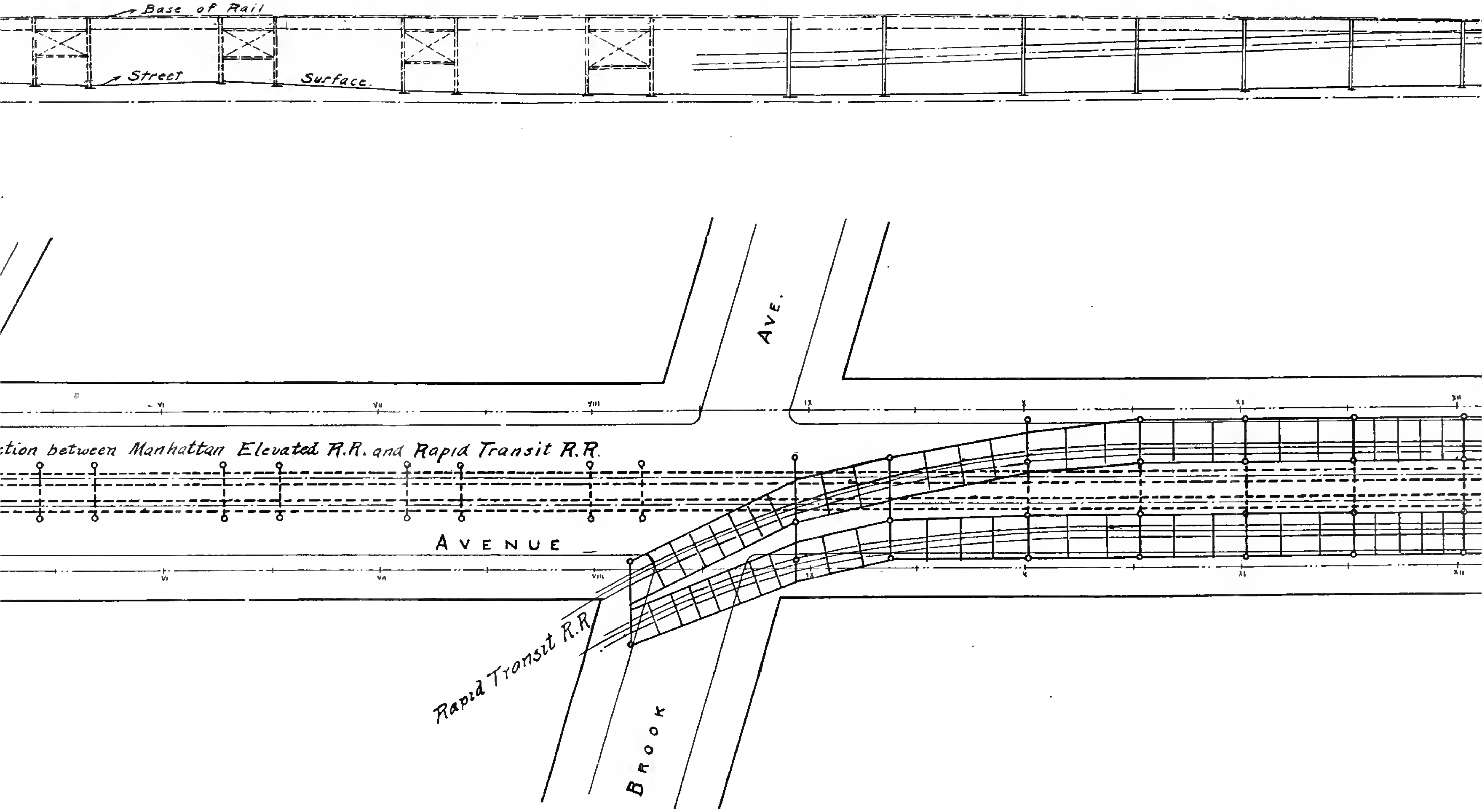




Wm. Barclay Parsons.
Chief Engineer.

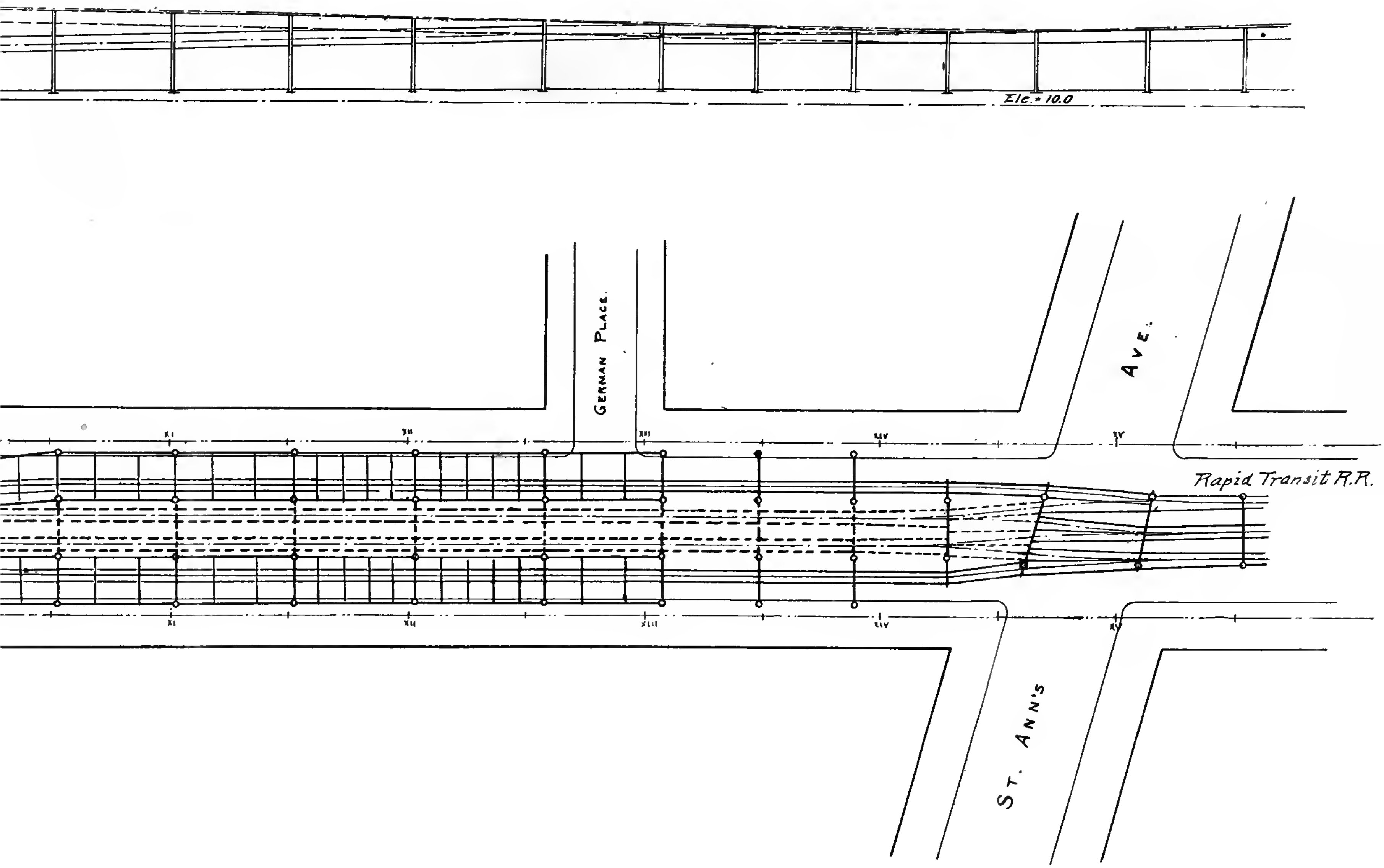
A. E. Orr
Jno. H. Starin
Woodbury Langdon
Smith
Jno. Claflin

Commissioners


Base of Rail
Street
Surface.
AVE.
ction between Manhattan Elevated R.R. and Rapid Transit R.R.
AVENUE
Rapid Transit R.R.
BROOK
VI
VII
VIII
IX
X
XI
XII

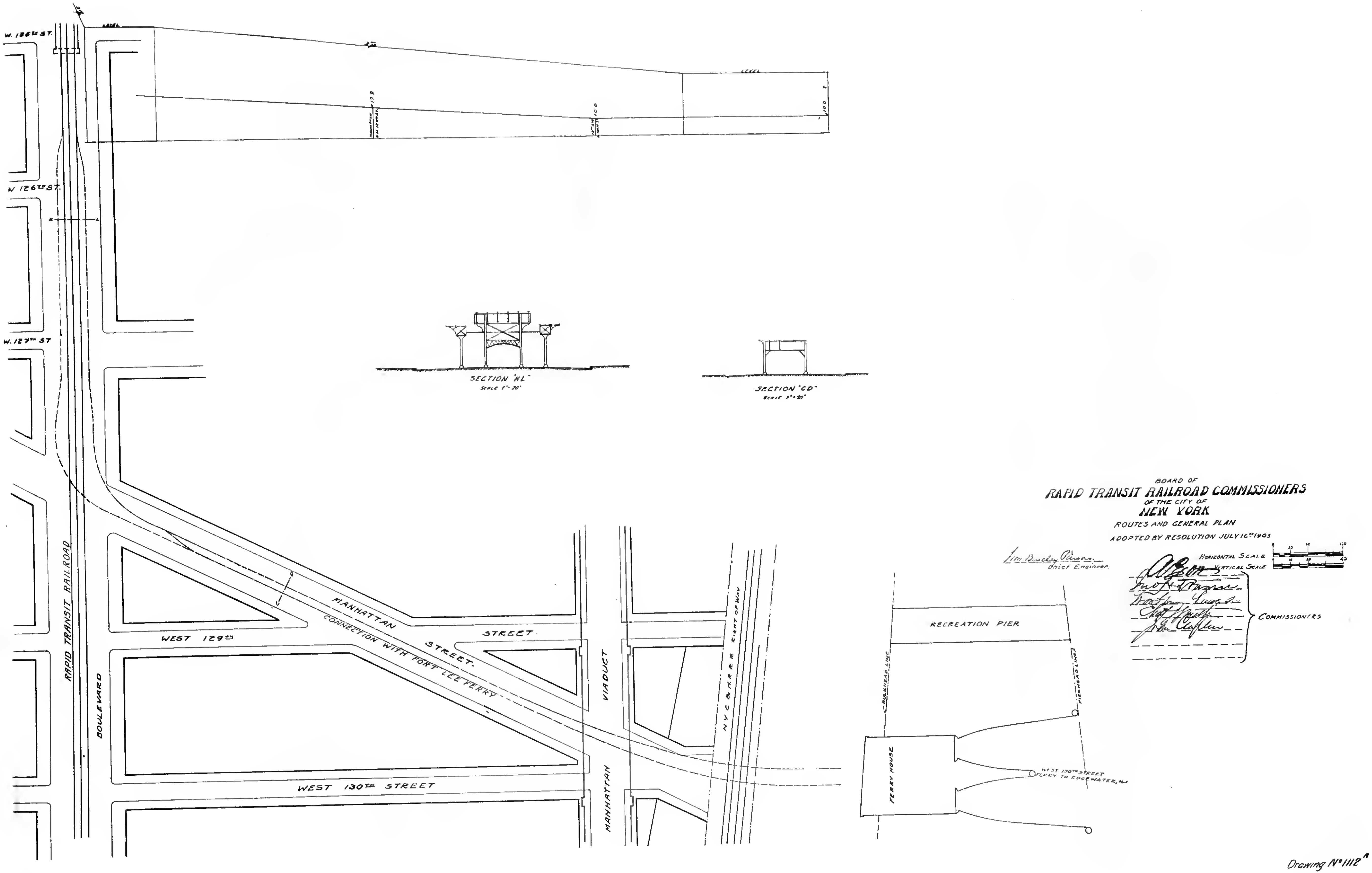
RAPID TRA

AD



BOARD OF
RAPID TRANSIT RAILROAD COMMISSIONERS
OF THE CITY OF
NEW YORK
ROUTES AND GENERAL PLAN
ADOPTED BY RESOLUTION JULY 16th, 1903.

SCALE 0 10 20 30 40 80 120

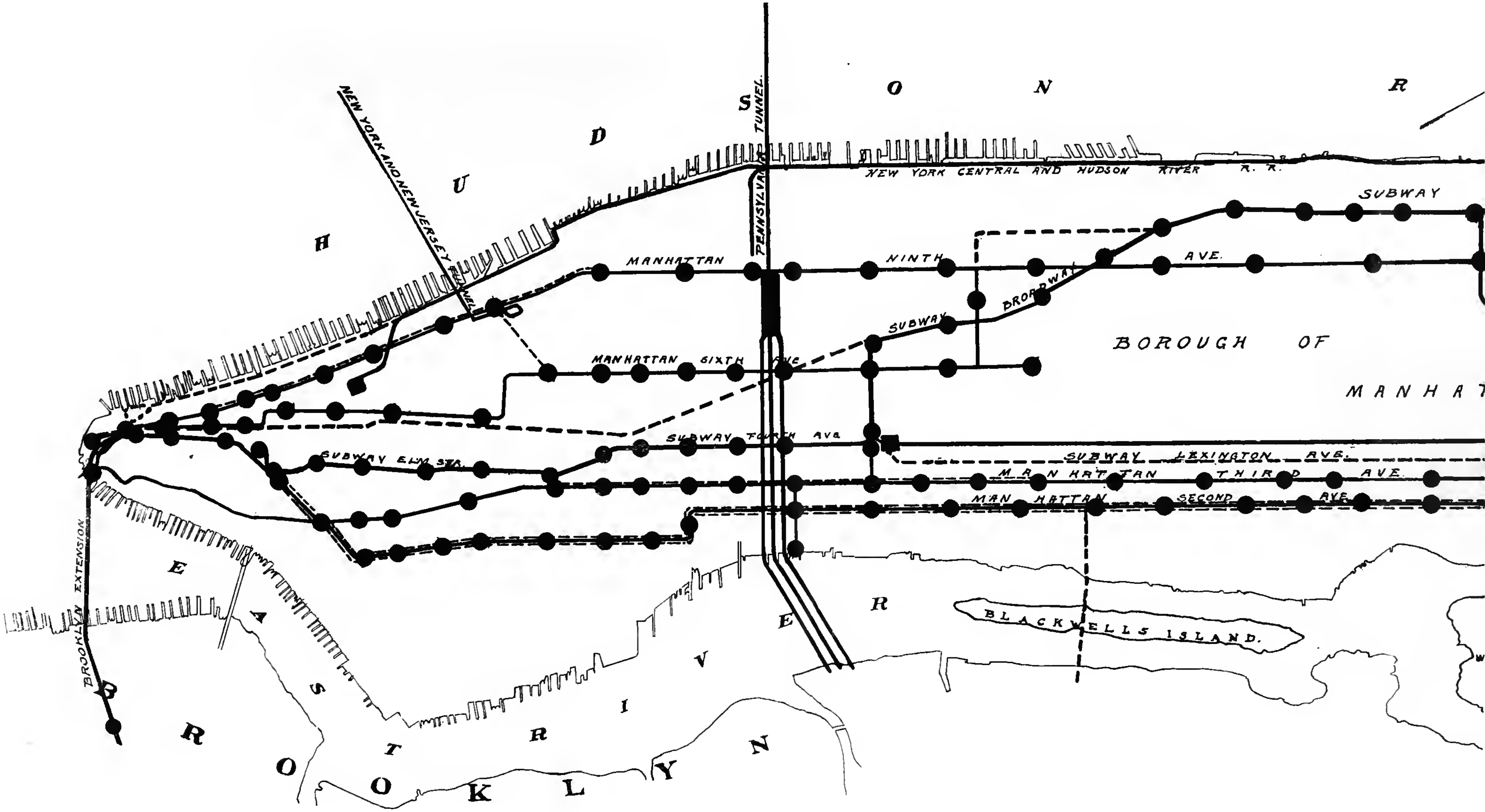


BOARD OF
RAPID TRANSIT RAILROAD COMMISSIONERS
OF THE CITY OF
NEW YORK
ROUTES AND GENERAL PLAN
ADOPTED BY RESOLUTION JULY 16th 1903

Wm. Barclay Parsons
Chief Engineer.

Commissioners

Drawing No 1112A



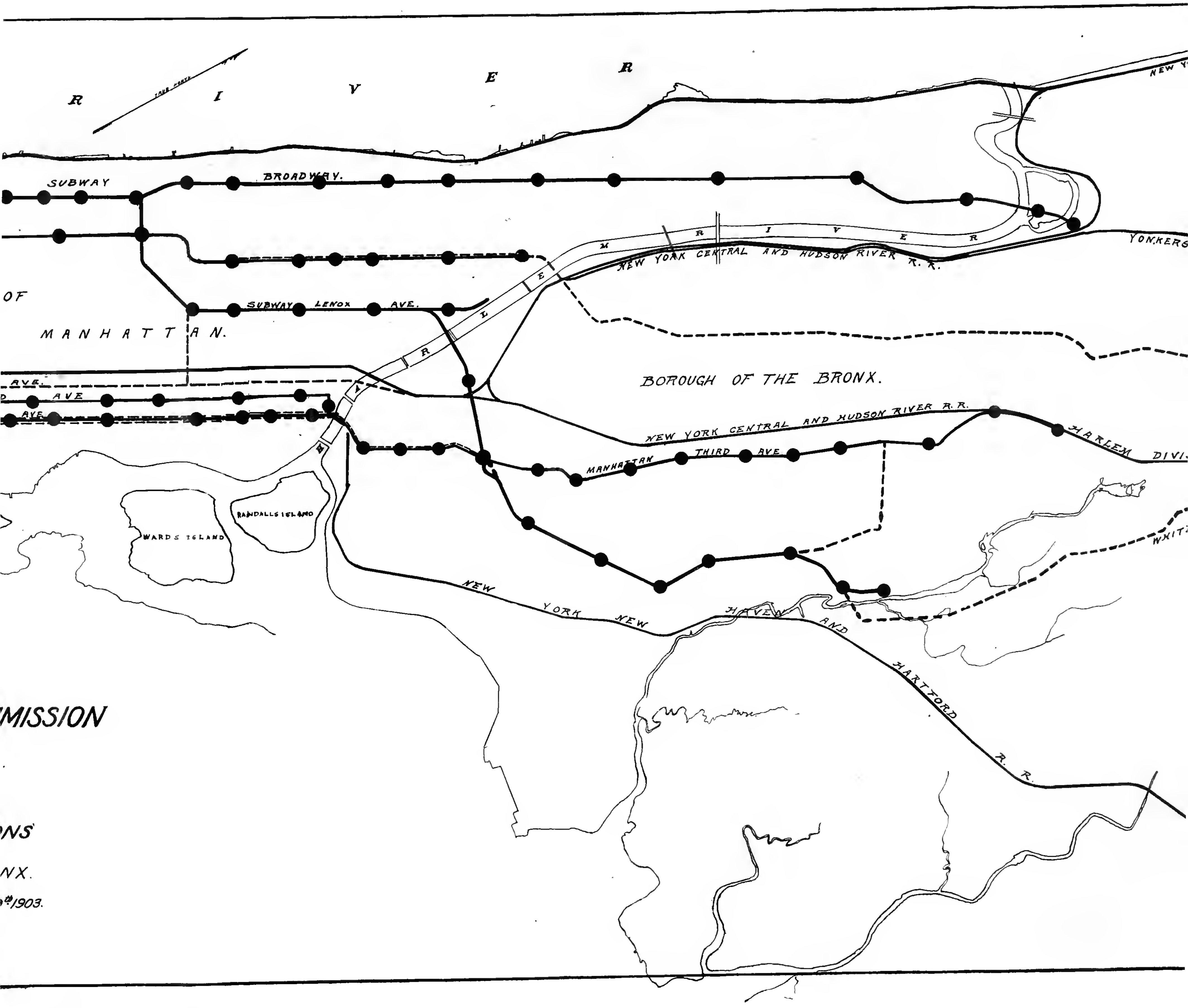
RAPID TRANSIT RAILROAD COMMISSION

PROPOSED LINES SHOWN DOTTED.
PRESENT LINES SHOWN FULL.

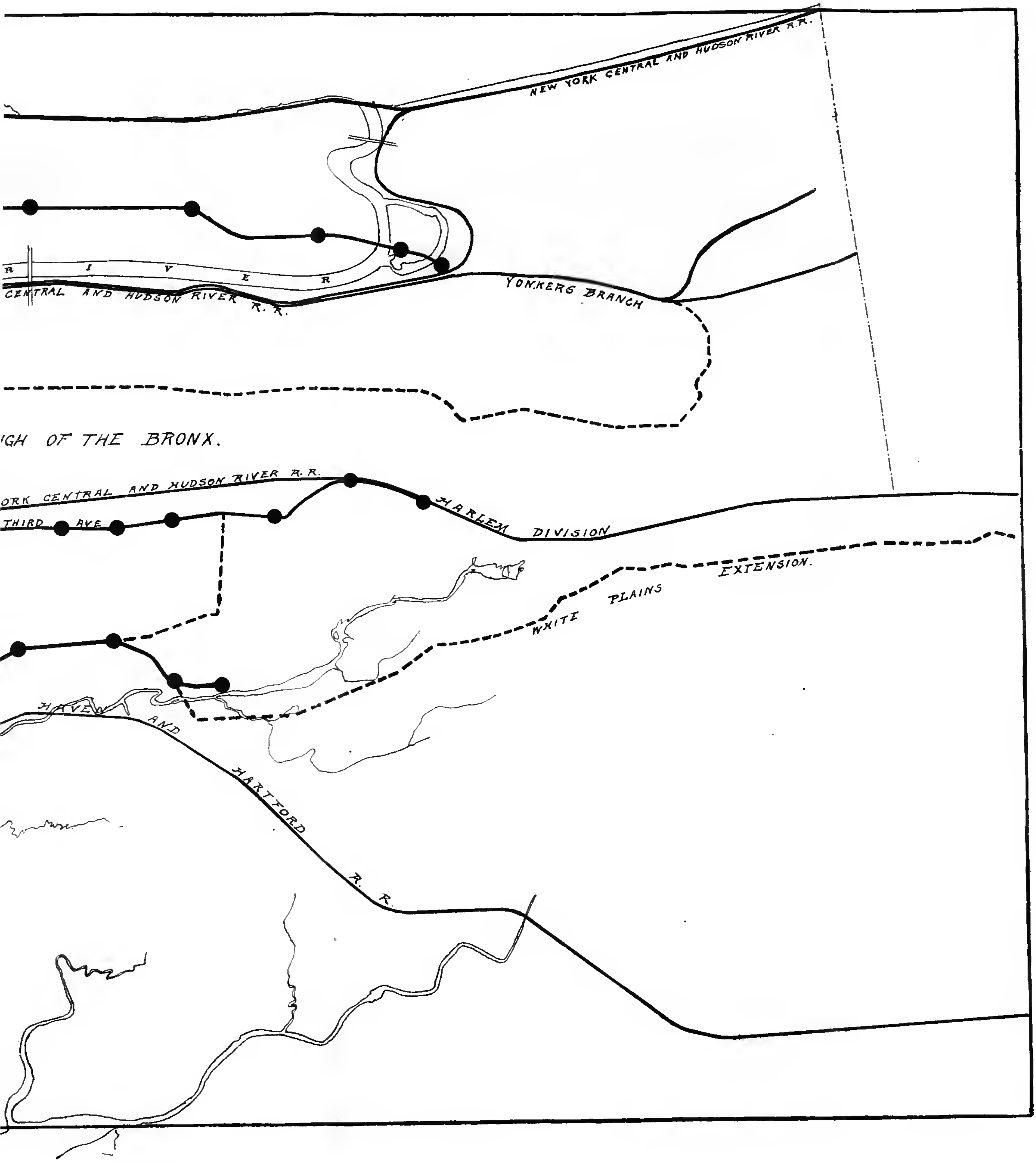
MAP OF RAPID TRANSIT EXTENSIONS

BORROUGHS OF MANHATTAN AND BRONX.

ACCOMPANYING REPORT OF CHIEF ENGINEER FEB. 19th 1903.



TRUE NORTH
R I V E R
NEW Y
SUBWAY
BROADWAY.
OF
MANHATTAN.
SUBWAY LENOX AVE.
H A R L E M R I V E R
NEW YORK CENTRAL AND HUDSON RIVER R.R.
YONKERS
BOROUGH OF THE BRONX.
AVE.
AVE
AVE.
NEW YORK CENTRAL AND HUDSON RIVER R.R.
HARLEM DIV.
MANHATTAN THIRD AVE
RANDALLS ISLAND
WARDS ISLAND
WHIT
NEW YORK NEW HAVEN AND HARTFORD R.R.
MISSION
NS
NX.
th 1903.


NEW YORK CENTRAL AND HUDSON RIVER R.R.
R I V E R
CENTRAL AND HUDSON RIVER R.R.
YONKERS BRANCH
GH OF THE BRONX.
ORK CENTRAL AND HUDSON RIVER R.R.
HARLEM DIVISION
THIRD AVE.
WHITE PLAINS EXTENSION.
HAVEN AND HARTFORD R.R.

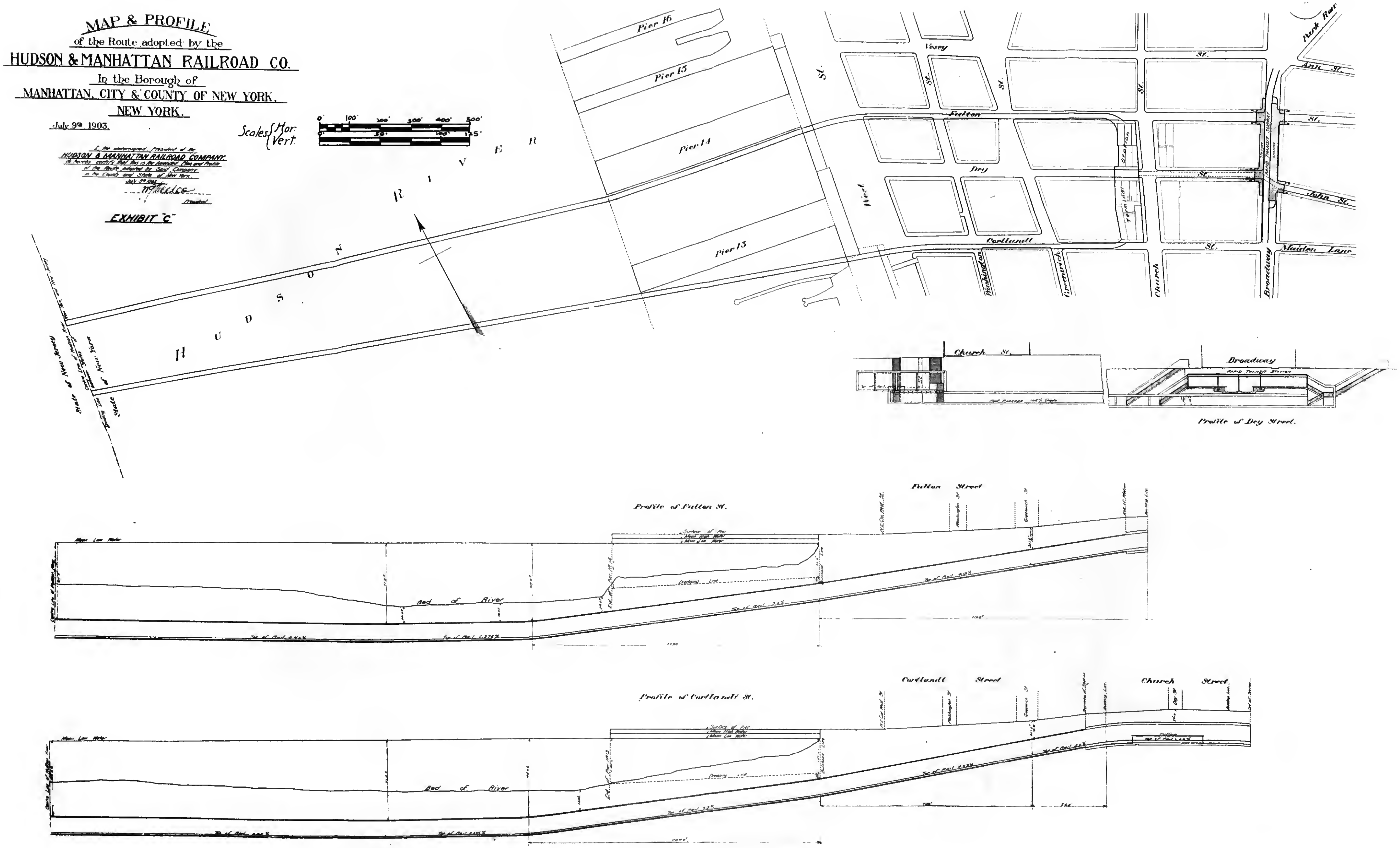
MAP & PROFILE
of the Route adopted by the
HUDSON & MANHATTAN RAILROAD CO.
In the Borough of
MANHATTAN, CITY & COUNTY OF NEW YORK,
NEW YORK.

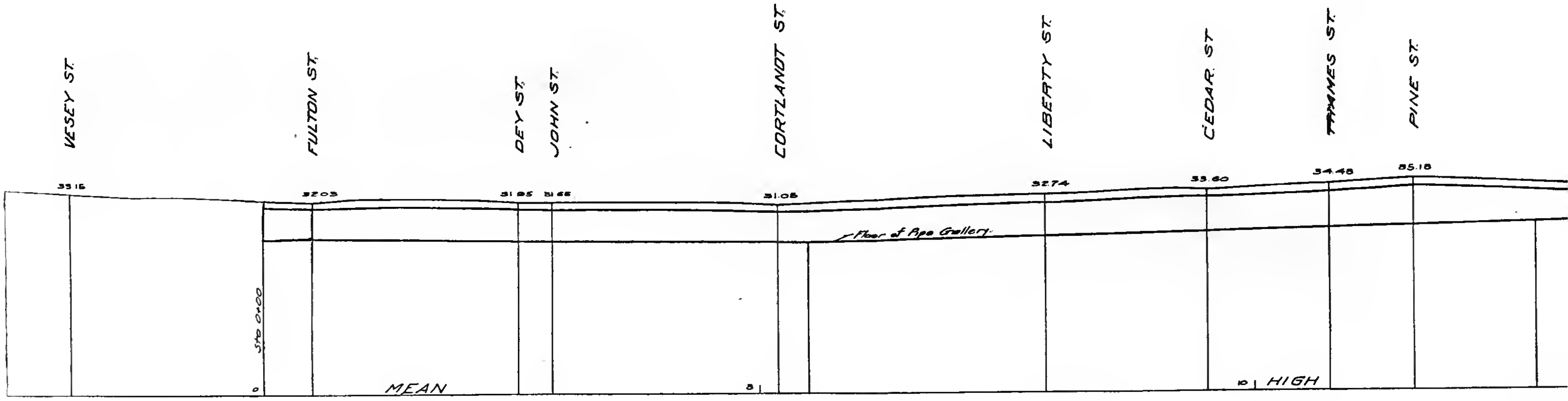
July 9th 1903.

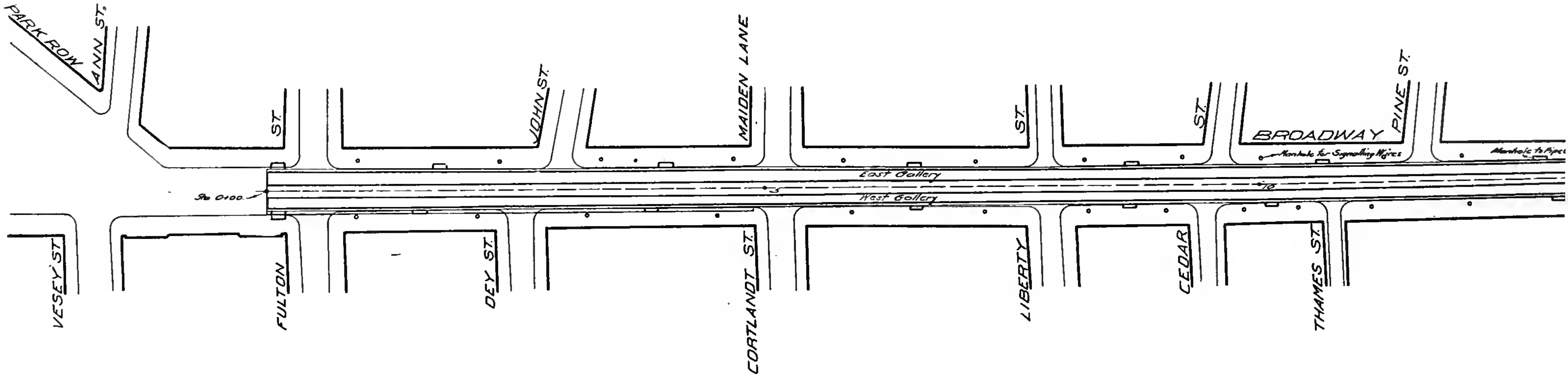
I, the undersigned, President of the
HUDSON & MANHATTAN RAILROAD COMPANY,
do hereby certify that this is the Amended Plan and Profile
of the Route adopted by Said Company
in the County and State of New York.
July 9th 1903.

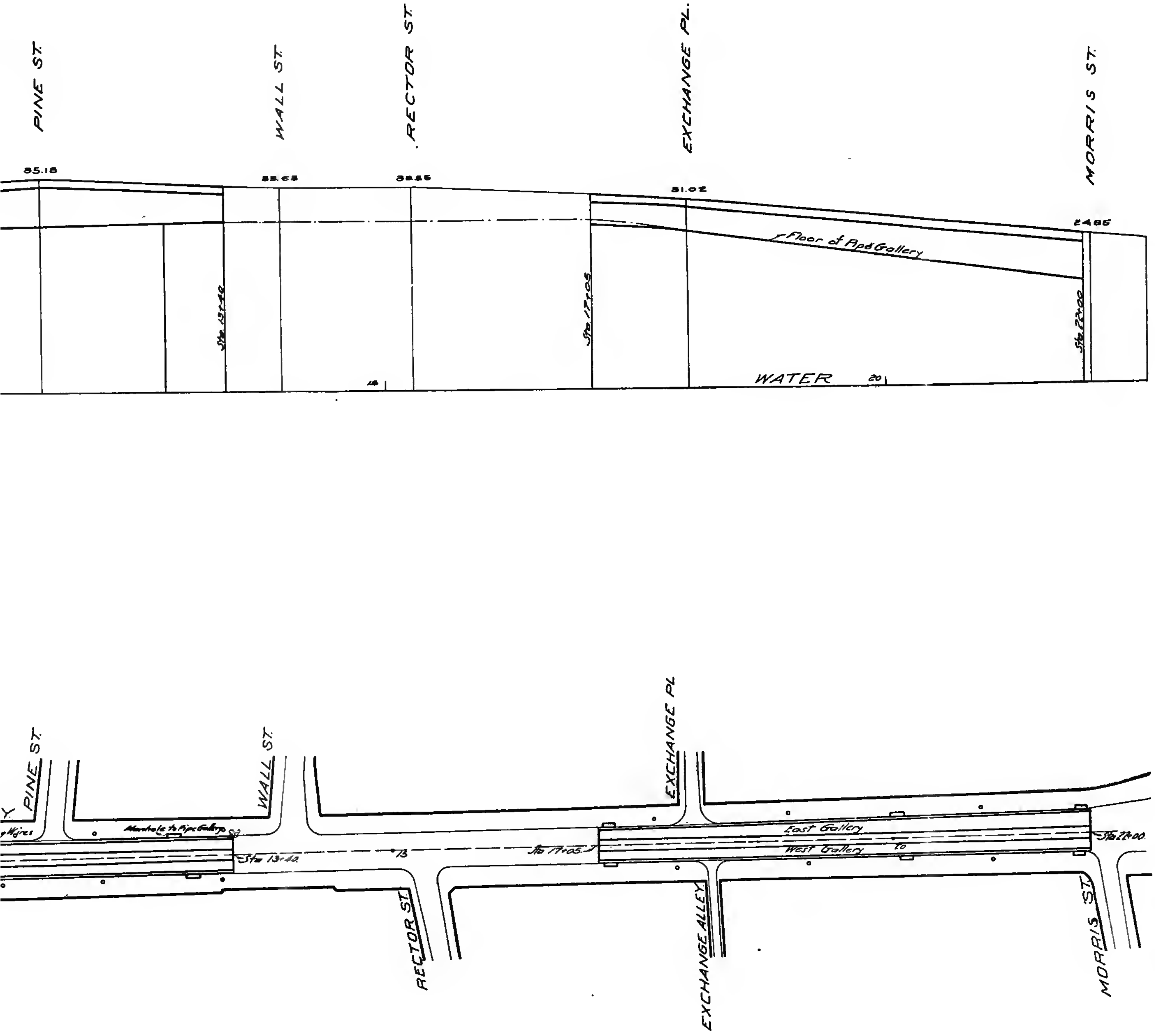
W. G. McAdoo
President

EXHIBIT "C"




VESEY ST.
FULTON ST.
DEY ST.
JOHN ST.
CORTLANDT ST.
LIBERTY ST.
CEDAR ST.
THAMES ST.
PINE ST.
33.16
32.03
31.95
31.66
31.08
32.74
33.60
34.48
35.18
Floor of Pipe Gallery
Sta 0+00
0
5
10
MEAN
HIGH


PARK ROW
ANN ST.
ST.
JOHN ST.
MAIDEN LANE
ST.
ST.
BROADWAY
PINE ST.
Manhole for Signalling Wires
Manhole to Pipe
East Gallery
West Gallery
Sta 0+00.
5
10
VESEY ST.
FULTON
DEY ST.
CORTLANDT ST.
LIBERTY
CEDAR
THAMES ST.



DESIGN
OF
PIPE AND WIRE GALLERIES.
FOR
LOWER BROADWAY, N.Y.
– Plan –

SHEET NO. 1

Scales { Vertical 0' 100' 200' 300'
{ Horizontal 0' 100' 200'

James C. Bayles.
Cons. Engr.